ANNEX B. EVALUATION RESULTS

CONTENTS

ANNEX B. EVALUATION RESULTS

INTRODUCTION

This annex presents detailed tables and graphs of results gained from the on-site evaluation of the Crescent Demonstration project. This evaluation examined the accuracy of the Crescent equipment and the impact on weighstation operations of the use of the HELP concept. These results have been summarized in Chapter 5. The results are presented in the following order:

(1) automatic vehicle classification accuracy,
(2) axle spacing measurement accuracy,
(3) weigh-in-motion analysis graphs,
(5) proportion of overweight trucks,
(6) truck transit times through weighstations, and
(7) queuing analysis.

Within each of these different sections of results in Annex B, there is a description of the format of the presentation of the results and any explanatory notes that are required. Additionally, points of interests that have not been described in Chapter 5 are highlighted.

AUTOMATIC VEHICLE CLASSIFICATION ACCURACY

This section presents the results of the automatic vehicle classification (AVC) equipment assessment. This assessment compared manual classification observations undertaken by trained observers with the automatic vehicle classifications recorded by the AVC equipment.

The results are presented in a tabular format which displays the number of observations recorded in terms of their manual and automatic vehicle classifications. For each assessment of AVC equipment accuracy during the on-site evaluation two or three tables are given. These tables present the following information:

(1) the actual observed comparison of manual and automatic classifications,

(2) the manual/automatic classification comparison following the screening of low weight and size vehicles. The Crescent AVC system screens out observations of vehicles of class 6 and under in the FHWA F Scheme classification. This screening reduces the number of vehicles recorded and therefore the amount of computer data to be stored. The result of screening is that a number of manual classification observations for small vehicles have no corresponding automatic classification record. These vehicles apparently missed by the AVC equipment reduce the observed equipment accuracy.

The table (marked Note A) shows the AVC accuracy after removal of all manual vehicle classifications of class 6 and under that have no associated automatic record. Due to the automated screening process these tables may be considered the true observed AVC accuracy, and

(3) Following the screening of smaller vehicles by the AVC system, it is apparent that the manual and automatic observations often differ in a consistent manner. Two sources of error exist for these consistent differences in classification. The first relates to the method used to classify vehicles by the AVC system, which utilizes the number of axles, wheelbase and axle spacings of vehicles. These differences may indicate vehicles that have non-typical features, such as short wheelbases, that results in placement into an incorrect classification. The second possible source of error is observer error which occurs most frequently with high traffic flows on mainline sites.

The tables (marked Notes B and C) demonstrate the effects on AVC accuracy due to modifications in these observations to gain consistency between manual and automatic records. These modifications are given by the notation as follows:

Note B - AVC classifies class 5 vehicles whereas manual observations indicate class 3 vehicles. The automatic observations have been modified to class 5.

Note C - AVC classifies class 3 vehicles whereas manual observations indicate class 4 vehicles. The automatic observations have been modified to class 3.

Results for the following sites are presented:

* Jefferson,
* Ashland (mainline),
* Bakersfield,
* South Pheonix,
* Seguin,
* Kelso,
* Woodburn, and
* Bow Hill.

At the South Pheonix site, the AVC failed to classify 50% of vehicles. This non-classification may be due to equipment failure or poor lane discipline by vehicles at this mainline site.

B.A.1.1 - AUTOMATIC VEHICLE CLASSIFICATION ACCURACY

JEFFERSON, OR APRIL 7, 1993

WIM CLASS	MANUAL CLASS																			NO RECORD	AVCS CLASS TOTALS	AVCS GRAND TOTALS
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19			
1																					0	193
2																					0	
3																					0	
4																					0	
5					4																4	
6						3															3	
7																					0	
8					1			3	1												5	
9																					0	
10																					0	
11											127										127	
12											3	4									7	
13											9		1		1						11	
14														7	2						9	
15																					0	
16																					0	
17											2						7				9	
18																	2	14			16	
19																			2		2	
0																					0	
SPURIOUS																						
NO RECORD	161	2	6																			
MANUAL CLASS TOTAL	161	2	6	0	5	3	0	3	1	0	141	4	1	7	3	0	9	14	2			
MANUAL GRAND TOTAL	362																					

Total absolute difference = 47.5 %

Total percentage difference = 42.8 %

B.A.1.2 - AUTOMATIC VEHICLE CLASSIFICATION ACCURACY

JEFFERSON, OR APRIL 7, 1993

WIM CLASS	MANUAL CLASS																			NO RECORD	AVCS CLASS TOTALS	AVCS GRAND TOTALS
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19			
1																					0	193
2																					0	
3																					0	
4																					0	
5					4																4	
6						3															3	
7																					0	
8					1			3	1												5	
9																					0	
10																					0	
11											127										127	
12											3	4									7	
13											9		1		1						11	
14														7	2						9	
15																					0	
16																					0	
17											2						7				9	
18																	2	14			16	
19																			2		2	
0																					0	
SPURIOUS																						
NO RECORD																						
MANUAL CLASS TOTAL	0	0	0	0	5	3	0	3	1	0	141	4	1	7	3	0	9	14	2			
MANUAL GRAND TOTAL	193																					

Total absolute difference = 89.1 %

Total percentage difference = 80.3 %

NOTE: A

B.B.1.1 - AUTOMATIC VEHICLE CLASSIFICATION ACCURACY

ASHLAND, OR. APRIL 5, 1993

WIM CLASS	MANUAL CLASS																			NO RECORD	AVCS CLASS TOTALS	AVCS GRAND TOTALS
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19			
1																					0	84
2																					0	
3			1																		1	
4																					0	
5				1							5										6	
6																					0	
7																					0	
8								7													7	
9											1										1	
10																					0	
11											48										48	
12											3	12									15	
13											4										4	
14															2						2	
15																					0	
16																					0	
17																					0	
18																					0	
19																					0	
0																					0	
SPURIOUS																						
NO RECORD		1	3	1								1										
MANUAL CLASS TOTAL	0	1	4	2	0	0	0	7	0	0	61	13	0	0	2	0	0	0	0			
MANUAL GRAND TOTAL	90																					

Total absolute difference = 75.6 %

Total percentage difference = 60.0 %

B.B.1.2 - AUTOMATIC VEHICLE CLASSIFICATION ACCURACY

ASHLAND, OR. APRIL 5, 1993

WIM CLASS	MANUAL CLASS																			NO RECORD	AVCS CLASS TOTALS	AVCS GRAND TOTALS
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19			
1																					0	84
2																					0	
3			1																		1	
4																					0	
5				1							5										6	
6																					0	
7																					0	
8								7													7	
9											1										1	
10																					0	
11											48										48	
12											3	12									15	
13											4										4	
14															2						2	
15																					0	
16																					0	
17																					0	
18																					0	
19																					0	
0																					0	
SPURIOUS																						
NO RECORD												1										
MANUAL CLASS TOTAL	0	0	1	1	0	0	0	7	0	0	61	13	0	0	2	0	0	0	0			
MANUAL GRAND TOTAL	85																					

Total absolute difference = 80.0 %

Total percentage difference = 63.5 %

NOTE: A

B.C.1.1 - AUTOMATIC VEHICLE CLASSIFICATION ACCURACY

BAKERSFIELD, CA APRIL 16, 1993

WIM CLASS	MANUAL CLASS														SPURIOUS	NO RECORD	AVCS CLASS TOTALS	AVCS GRAND TOTALS
	1	2	3	4	5	6	7	8	9	10	11	12	13	N				
1																	0	196
2																	0	
3		1	2														3	
4				2													2	
5	1		6	8	1												16	
6	1					2											3	
7																	0	
8								10	1								11	
9			2						119		8						129	
10																	0	
11											27						27	
12				1								2					3	
13													1				1	
N									1								1	
SPURIOUS																		
NO RECORD	4	13	9	2					2		1							
MANUAL CLASS TOTAL	6	14	19	13	1	2	0	10	123	0	35	3	1	0				
MANUAL GRAND TOTAL	227																	

Total absolute accuracy = 73.1 %

Total compensated accuracy = 65.2 %

B.C.1.2 - AUTOMATIC VEHICLE CLASSIFICATION ACCURACY

BAKERSFIELD, CA APRIL 16, 1993

WIM CLASS	MANUAL CLASS														SPURIOUS	NO RECORD	AVCS CLASS TOTALS	AVCS GRAND TOTALS
	1	2	3	4	5	6	7	8	9	10	11	12	13	N				
1																	0	196
2																	0	
3		1	2														3	
4				2													2	
5	1		6	8	1												16	
6	1					2											3	
7																	0	
8								10	1								11	
9			2						119		8						129	
10																	0	
11											27						27	
12				1								2					3	
13													1				1	
N									1								1	
SPURIOUS																		
NO RECORD									2		1							
MANUAL CLASS TOTAL	2	1	10	11	1	2	0	10	123	0	35	3	1	0				
MANUAL GRAND TOTAL	199																	

Total absolute accuracy = 83.4%

Total compensated accuracy = 74.4 %

NOTE: A

B.D.1.1 - AUTOMATIC VEHICLE CLASSIFICATION ACCURACY

S. PHOENIX, AZ MARCH 25, 1993

WIM CLASS	MANUAL CLASS														SPURIOUS	NO RECORD	AVCS CLASS TOTALS	AVCS GRAND TOTALS
	1	2	3	4	5	6	7	8	9	10	11	12	13	N				
1																	0	136
2		1	1														2	
3		1	6					1									8	
4			2														2	
5		2	16	2		2											22	
6						8											8	
7							1										1	
8						1		8	1								10	
9									65		2						67	
10																	0	
11											3						3	
12											1						1	
13																	0	
N			1			1		7	3								12	
SPURIOUS																		
NO RECORD		12	17			3		10	15		6	1	2					
MANUAL CLASS TOTAL	0	16	43	2	0	15	1	26	84	0	12	1	2	0				
MANUAL GRAND TOTAL	202																	

Total absolute accuracy = 45.5 %

Total compensated accuracy = 33.7 %

B.D.1.2 - AUTOMATIC VEHICLE CLASSIFICATION ACCURACY

S. PHOENIX, AZ MARCH 25, 1993

WIM CLASS	MANUAL CLASS														SPURIOUS	NO RECORD	AVCS CLASS TOTALS	AVCS GRAND TOTALS
	1	2	3	4	5	6	7	8	9	10	11	12	13	N				
1																	0	136
2		1	1														2	
3		1	6					1									8	
4			2														2	
5		2	16	2		2											22	
6						8											8	
7							1										1	
8						1		8	1								10	
9									65		2						67	
10																	0	
11											3						3	
12											1						1	
13																	0	
N			1			1		7	3								12	
SPURIOUS																		
NO RECORD								10	15		6	1	2					
MANUAL CLASS TOTAL	0	4	26	2	0	12	1	26	84	0	12	1	2	0				
MANUAL GRAND TOTAL	170																	

Total absolute accuracy = 54.1 %

Total compensated accuracy = 40.0 %

NOTE: A

B.D.1.3 - AUTOMATIC VEHICLE CLASSIFICATION ACCURACY

S.PHOENIX, AZ MARCH 25, 1993

WIM CLASS	MANUAL CLASS														SPURIOUS	NO RECORD	AVCS CLASS TOTALS	AVCS GRAND TOTALS
	1	2	3	4	5	6	7	8	9	10	11	12	13	N				
1																	0	136
2		1	1														2	
3		1	22					1									24	
4			2														2	
5		2		2		2											6	
6						8											8	
7							1										1	
8						1		8	1								10	
9									65		2						67	
10																	0	
11											3						3	
12											1						1	
13																	0	
N			1			1		7	3								12	
SPURIOUS																		
NO RECORD								10	15		6	1	2					
MANUAL CLASS TOTAL	0	4	22	2	0	12	1	26	84	0	12	1	2	0				
MANUAL GRAND TOTAL	170																	

Total absolute accuracy = 63.5 %

Total compensated accuracy = 58.8 %

NOTE: B

B.E.1.1 - AUTOMATIC VEHICLE CLASSIFICATION ACCURACY

SEGUIN, TX JANUARY 28 & 29, 1993 LANE 3

WIM CLASS	MANUAL CLASS														SPURIOUS	NO RECORD	AVCS CLASS TOTALS	AVCS GRAND TOTALS
	1	2	3	4	5	6	7	8	9	10	11	12	13	N				
1																	0	131
2																1	1	
3		1														3	4	
4				5													5	
5			13													5	18	
6						1										2	3	
7																	0	
8								2	3							1	6	
9		1							78		1				1	1	82	
10																	0	
11											2						2	
12																	0	
13																	0	
N			1					1	3							5	10	
SPURIOUS																		
NO RECORD		4	4	4				5	7									
MANUAL CLASS TOTAL	0	6	18	9	0	1	0	8	91	0	3	0	0	0				
MANUAL GRAND TOTAL	136																	

Total absolute accuracy = 64.7 %

Total compensated accuracy = 52.2%

B.E.1.2 - AUTOMATIC VEHICLE CLASSIFICATION ACCURACY

SEGUIN, TX JANUARY 28 & 29, 1993 LANE 3

WIM CLASS	MANUAL CLASS														SPURIOUS	NO RECORD	AVCS CLASS TOTALS	AVCS GRAND TOTALS
	1	2	3	4	5	6	7	8	9	10	11	12	13	N				
1																	0	131
2																1	1	
3		1														3	4	
4				5													5	
5			13													5	18	
6						1										2	3	
7																	0	
8								2	3							1	6	
9		1							78		1				1	1	82	
10																	0	
11											2						2	
12																	0	
13																	0	
N			1					1	3							5	10	
SPURIOUS																		
NO RECORD								5	7									
MANUAL CLASS TOTAL	0	2	14	5	0	1	0	8	91	0	3	0	0	0				
MANUAL GRAND TOTAL	124																	

Total absolute accuracy = 71.0 %

Total compensated accuracy = 57.3 %

NOTE: A

B.E.1.3 - AUTOMATIC VEHICLE CLASSIFICATION ACCURACY

SEGUIN, TX JANUARY 28 & 29, 1993 LANE 3

WIM CLASS	MANUAL CLASS														SPURIOUS	NO RECORD	AVCS CLASS TOTALS	AVCS GRAND TOTALS
	1	2	3	4	5	6	7	8	9	10	11	12	13	N				
1																	0	131
2																1	1	
3		1	13													3	17	
4				5													5	
5																5	5	
6						1										2	3	
7																	0	
8								2	3							1	6	
9		1							78		1				1	1	82	
10																	0	
11											2						2	
12																	0	
13																	0	
N			1					1	3							5	10	
SPURIOUS																		
NO RECORD								5	7									
MANUAL CLASS TOTAL	0	2	14	5	0	1	0	8	91	0	3	0	0	0				
MANUAL GRAND TOTAL	124																	

Total absolute accuracy = 81.5 %

Total compensated accuracy = 73.4 %

NOTE: B

B.E.1.4 - AUTOMATIC VEHICLE CLASSIFICATION ACCURACY

SEGUIN, TX JANUARY 28 & 29, 1993 LANE 4

WIM CLASS	MANUAL CLASS														SPURIOUS	NO RECORD	AVCS CLASS TOTALS	AVCS GRAND TOTALS
	1	2	3	4	5	6	7	8	9	10	11	12	13	N				
1																	0	589
2																	0	
3			2					1								1	4	
4			3	2			1		2								8	
5			63	2				1	1							3	70	
6			1			19										1	21	
7																	0	
8		1	3	6		11		29	5							1	56	
9		2	1	1		1			386							1	392	
10									3								3	
11								1			7						8	
12											1						1	
13																	0	
N		1	1	1				4	11							8	26	
SPURIOUS																		
NO RECORD		43	30	7		2	1	29	11		9							
MANUAL CLASS TOTAL	0	47	104	19	0	33	2	65	419	0	17	0	0	0				
MANUAL GRAND TOTAL	706																	

Total absolute accuracy = 63.0 %

Total compensated accuracy = 55.1 %

B.E.1.5 - AUTOMATIC VEHICLE CLASSIFICATION ACCURACY

SEGUIN, TX JANUARY 28 & 29, 1993 LANE 4

WIM CLASS	MANUAL CLASS														SPURIOUS	NO RECORD	AVCS CLASS TOTALS	AVCS GRAND TOTALS
	1	2	3	4	5	6	7	8	9	10	11	12	13	N				
1																	0	589
2																	0	
3			2					1								1	4	
4			3	2			1		2								8	
5			63	2				1	1							3	70	
6			1			19										1	21	
7																	0	
8		1	3	6		11		29	5							1	56	
9		2	1	1		1			386							1	392	
10									3								3	
11								1			7						8	
12											1						1	
13																	0	
N		1	1	1				4	11							8	26	
SPURIOUS																		
NO RECORD							1	29	11		9							
MANUAL CLASS TOTAL	0	4	74	12	0	31	2	65	419	0	17	0	0	0				
MANUAL GRAND TOTAL	624																	

Total absolute accuracy = 71.3 %

Total compensated accuracy = 62.3%

NOTE: A

B.E.1.6 - AUTOMATIC VEHICLE CLASSIFICATION ACCURACY

SEGUIN, TX JANUARY 28 & 29, 1993 LANE 4

WIM CLASS	MANUAL CLASS														SPURIOUS	NO RECORD	AVCS CLASS TOTALS	AVCS GRAND TOTALS
	1	2	3	4	5	6	7	8	9	10	11	12	13	N				
1																	0	589
2																	0	
3			65					1								1	67	
4			3	2			1		2								8	
5				2				1	1							3	7	
6			1			19										1	21	
7																	0	
8		1	3	6		11		29	5							1	56	
9		2	1	1		1			386							1	392	
10									3								3	
11								1			7						8	
12											1						1	
13																	0	
N		1	1	1				4	11							8	26	
SPURIOUS																		
NO RECORD									11		9							
MANUAL CLASS TOTAL	0	4	74	12	0	31	2	65	419	0	17	0	0	0				
MANUAL GRAND TOTAL	624																	

Total absolute accuracy = 81.4 %

Total compensated accuracy = 82.5 %

NOTE: B

B.F.1.1 - AUTOMATIC VEHICLE CLASSIFICATION ACCURACY

KELSO, WA JULY 29, 1993

WIM CLASS	MANUAL CLASS														SPURIOUS	NO RECORD	AVCS CLASS TOTALS	AVCS GRAND TOTALS
	1	2	3	4	5	6	7	8	9	10	11	12	13	N				
1																	0	71
2																	0	
3																	0	
4			1														1	
5			5														5	
6						1											1	
7																	0	
8						2		3									5	
9									53								53	
10																	0	
11											2						2	
12												2					2	
13													2				2	
N																	0	
SPURIOUS																		
NO RECORD			1						3									
MANUAL CLASS TOTAL	0	0	7	0	0	3	0	3	56	0	2	2	2	0				
MANUAL GRAND TOTAL	75																	

Total absolute accuracy = 84.0 %

Total compensated accuracy = 73.3 %

B.F.1.2 - AUTOMATIC VEHICLE CLASSIFICATION ACCURACY

KELSO, WA JULY 29, 1993

WIM CLASS	MANUAL CLASS														SPURIOUS	NO RECORD	AVCS CLASS TOTALS	AVCS GRAND TOTALS
	1	2	3	4	5	6	7	8	9	10	11	12	13	N				
1																	0	71
2																	0	
3																	0	
4			1														1	
5			5														5	
6						1											1	
7																	0	
8						2		3									5	
9									53								53	
10																	0	
11											2						2	
12												2					2	
13													2				2	
N																	0	
SPURIOUS																		
NO RECORD									3									
MANUAL CLASS TOTAL	0	0	6	0	0	3	0	3	56	0	2	2	2	0				
MANUAL GRAND TOTAL	74																	

Total absolute accuracy = 85.1 %

Total compensated accuracy = 74.3 %

NOTE: A

B.F.1.3 - AUTOMATIC VEHICLE CLASSIFICATION ACCURACY

KELSO, WA JULY 29, 1993

WIM CLASS	MANUAL CLASS														SPURIOUS	NO RECORD	AVCS CLASS TOTALS	AVCS GRAND TOTALS
	1	2	3	4	5	6	7	8	9	10	11	12	13	N				
1																	0	71
2																	0	
3			5														5	
4			1														1	
5																	0	
6						1											1	
7																	0	
8						2		3									5	
9									53								53	
10																	0	
11											2						2	
12												2					2	
13													2				2	
N																	0	
SPURIOUS																		
NO RECORD									3									
MANUAL CLASS TOTAL	0	0	6	0	0	3	0	3	56	0	2	2	2	0				
MANUAL GRAND TOTAL	74																	

Total absolute accuracy = 91.9 %

Total compensated accuracy = 87.8 %

NOTE: B

B.J.1.1 - AUTOMATIC VEHICLE CLASSIFICATION ACCURACY

WOODBURN, OR. MAY 20, 1993

WIM CLASS	MANUAL CLASS																			NO RECORD	AVCS CLASS TOTALS	AVCS GRAND TOTALS
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19			
1																					0	637
2																					0	
3			1	48												1					2	
4																					48	
5					28						1										29	
6						10															10	
7																					0	
8								7													7	
9									2		5				1						8	
10																					0	
11											309		1	1	1						312	
12											2	16									18	
13											26		8		1						35	
14														22	1						23	
15											3				34	3					40	
16																1					1	
17															2		34				36	
18																	2	23			25	
19																			44		4	
0				1					1		22		1	2	4		2	5	1		39	
SPURIOUS																						
NO RECORD																						
MANUAL CLASS TOTAL	0	0	1	49	28	10	0	7	3	0	368	16	10	25	44	5	38	28	5			
MANUAL GRAND TOTAL	637																					

Total absolute difference = 72.2 %

Total percentage difference = 68.1 %

B.J.1.2 - AUTOMATIC VEHICLE CLASSIFICATION ACCURACY

WOODBURN, OR. MAY 20, 1993

WIM CLASS	MANUAL CLASS																			NO RECORD	AVCS CLASS TOTALS	AVCS GRAND TOTALS
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19			
1																					0	598
2																					0	
3			49													1					2	
4																					48	
5					28						1										29	
6						10															10	
7																					0	
8								7													7	
9									2		5				1						8	
10																					0	
11											309		1	1	1						312	
12											2	16									18	
13											26		8		1						35	
14														22	1						23	
15											3				34	3					40	
16																1					1	
17															2		34				36	
18																	2	23			25	
19																			44		4	
0				1					1		22		1	2	4		2	5	1		0	
SPURIOUS																						
NO RECORD																						
MANUAL CLASS TOTAL	0	0	49	1	28	10	0	7	3	0	368	16	10	25	44	5	38	28	5			
MANUAL GRAND TOTAL	637																					

Total absolute difference = 72.2 %

Total percentage difference = 83.2 %

NOTE: C

B.M.1.1 - AUTOMATIC VEHICLE CLASSIFICATION ACCURACY

BOW HILL, WA APRIL 13, 1993

WIM CLASS	MANUAL CLASS														SPURIOUS	NO RECORD	AVCS CLASS TOTALS	AVCS GRAND TOTALS
	1	2	3	4	5	6	7	8	9	10	11	12	13	N				
1																	0	52
2																	0	
3																	0	
4						1											1	
5			4														4	
6						4											4	
7																	0	
8								11									11	
9									21			1	1			1	24	
10												1					1	
11																	0	
12												2				1	3	
13													4				4	
N																	0	
SPURIOUS																		
NO RECORD			6					1										
MANUAL CLASS TOTAL	0	0	10	0	0	5	0	12	21	0	0	4	5	0				
MANUAL GRAND TOTAL	57																	

Total absolute accuracy = 73.7 %

Total compensated accuracy = 59.6 %

B.M.1.2 - AUTOMATIC VEHICLE CLASSIFICATION ACCURACY

BOW HILL, WA APRIL 13, 1993

WIM CLASS	MANUAL CLASS														SPURIOUS	NO RECORD	AVCS CLASS TOTALS	AVCS GRAND TOTALS
	1	2	3	4	5	6	7	8	9	10	11	12	13	N				
1																	0	52
2																	0	
3																	0	
4						1											1	
5			4														4	
6						4											4	
7																	0	
8								11									11	
9									21			1	1			1	24	
10												1					1	
11																	0	
12												2				1	3	
13													4				4	
N																	0	
SPURIOUS																		
NO RECORD								1										
MANUAL CLASS TOTAL	0	0	4	0	0	5	0	12	21	0	0	4	5	0				
MANUAL GRAND TOTAL	51																	

Total absolute accuracy = 82.4 %

Total compensated accuracy = 66.7 %

NOTE: A

B.M.1.3 - AUTOMATIC VEHICLE CLASSIFICATION ACCURACY

BOW HILL, WA APRIL 13, 1993

WIM CLASS	MANUAL CLASS														SPURIOUS	NO RECORD	AVCS CLASS TOTALS	AVCS GRAND TOTALS
	1	2	3	4	5	6	7	8	9	10	11	12	13	N				
1																	0	52
2																	0	
3			4														4	
4						1											1	
5																	0	
6						4											4	
7																	0	
8								11									11	
9									21			1	1			1	24	
10												1					1	
11																	0	
12												2				1	3	
13													4				4	
N																	0	
SPURIOUS																		
NO RECORD								1										
MANUAL CLASS TOTAL	0	0	4	0	0	5	0	12	21	0	0	4	5	0				
MANUAL GRAND TOTAL	51																	

Total absolute accuracy = 90.2 %

Total compensated accuracy = 82.4 %

NOTE: B

B.M.1.4 - AUTOMATIC VEHICLE CLASSIFICATION ACCURACY

BOW HILL, WA JUNE 25, 1993

WIM CLASS	MANUAL CLASS														SPURIOUS	NO RECORD	AVCS CLASS TOTALS	AVCS GRAND TOTALS
	1	2	3	4	5	6	7	8	9	10	11	12	13	N				
1																	1	310
2																	0	
3																	0	
4			1	2													3	
5			30			1			1								32	
6				1		12											13	
7																	0	
8								19	2			8					29	
9								1	191		1						193	
10									2	19							21	
11											6						6	
12																	0	
13													13				13	
N																	0	
SPURIOUS																		
NO RECORD			24					1										
MANUAL CLASS TOTAL	0	0	55	3	0	13	0	22	196	19	7	8	13	0				
MANUAL GRAND TOTAL	336																	

Total absolute accuracy = 78.0 %

Total compensated accuracy = 67.6 %

B.M.1.6 - AUTOMATIC VEHICLE CLASSIFICATION ACCURACY

BOW HILL, WA JUNE 25, 1993

WIM CLASS	MANUAL CLASS														SPURIOUS	NO RECORD	AVCS CLASS TOTALS	AVCS GRAND TOTALS
	1	2	3	4	5	6	7	8	9	10	11	12	13	N				
1																	1	310
2																	0	
3			30														30	
4			1	2													3	
5						1			1								2	
6				1		12											13	
7																	0	
8								19	2			8					29	
9								1	191		1						193	
10									2	19							21	
11											6						6	
12																	0	
13													13				13	
N																	0	
SPURIOUS																		
NO RECORD								1										
MANUAL CLASS TOTAL	0	0	31	3	0	13	0	22	196	19	7	8	13	0				
MANUAL GRAND TOTAL	312																	

Total absolute accuracy = 93.6 %

Total compensated accuracy = 92.0 %

NOTE: B

B.M.1.5 - AUTOMATIC VEHICLE CLASSIFICATION ACCURACY

BOW HILL, WA JUNE 25, 1993

WIM CLASS	MANUAL CLASS														SPURIOUS	NO RECORD	AVCS CLASS TOTALS	AVCS GRAND TOTALS
	1	2	3	4	5	6	7	8	9	10	11	12	13	N				
1																	1	310
2																	0	
3																	0	
4			1	2													3	
5			30			1			1								32	
6				1		12											13	
7																	0	
8								19	2			8					29	
9								1	191		1						193	
10									2	19							21	
11											6						6	
12																	0	
13													13				13	
N																	0	
SPURIOUS																		
NO RECORD								1										
MANUAL CLASS TOTAL	0	0	31	3	0	13	0	22	196	19	7	8	13	0				
MANUAL GRAND TOTAL	312																	

Total absolute accuracy = 84.0 %

Total compensated accuracy = 72.8 %

NOTE: A

AXLE SPACING MEASUREMENT ACCURACY

This section presents the results of the automatic axle spacing measurement equipment assessment. This assessment compared manually measured axle spacings with the automatic axle spacing measurements recorded by the WIM equipment on a vehicle-by vehicle basis.

The results are presented in a tabular format which displays the manual and automatic axle spacings and vehicle wheelbase. Additionally, the percentage and absolute difference between the manual and automatic measurements are shown. Results for the following sites are presented:

* Kelso,
* Woodburn,
* Bow Hill, and
* Santa Nelia.

B.F.2.1 - AXLE SPACING MEASUREMENT ACCURACY

KELSO, WA
JULY 29, 1993

VEHICLE NO.	MEASURED AXLE SPACING (ft)							WIM AXLE SPACING (ft)							ABSOLUTE DIFFERENCE (ft)							VEHICLE ABS. DIFF.
	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7	
1	13.8	4.4	27.0	4.1				13.9	4.5	27.7	4.1				0.1	0.1	0.7	0.0				0.9
2	18.0	4.5	20.8	4.3				18.3	4.5	21 2	4 4				0.3	0.0	0.4	0.1				0.8
3	18.8	4.3	31.3	4.2				19.4	4.4	32.2	4.3				0.6	0.1	0.9	0.1				1.7
4	10.0	7.8	4.4	30.3	4.0	4.3		10.3	7.9	4.5	31 3	4.2	4 3		0.3	0.1	1.0	0.2	0.0			1.7
5	10.4	4.3	20.9	9.2	22.3			10.5	4.3	21.2	9.3	22.9			0.1	0.0	0.3	0.1	0.6			1.1

Absolute difference per vehicle (ft)

Mean	1.2
S.D.(s)	0.4
Sample size	5

Absolute difference per axle spacing (ft)

Mean	0.3
S.D.(s)	0.3
Sample Size	23

(continued)

Continued

VEHICLE NO.	MEASURED AXLE SPACING (ft)							WIM AXLE SPACING (ft)							PERCENTAGE DIFFERENCE (%)							VEHICLE PERCNT. DIFF.
	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7	
1	13.8	4.4	27.0	4.1				13.9	4 5	27.7	4.1				0.7	2.3	2.6	0.0				1.8
2	18.0	4.5	20.8	4.3				18.3	4.5	21.2	4.4				1.7	0.0	1 9	2.3				1.7
3	18.8	4.3	31.3	4.2				19.4	4.4	32.2	4.3				3.2	2.3	2.9	2.4				2.9
4	10.0	7.8	4.4	30.3	4.0	4.3		10.3	7.9	4.5	31.3	4.2	4.3		3.0	1.3	2.3	3.3	5.0	0.0		2.8
5	10.4	4.3	20.9	9.2	22.3			10.5	4.3	21.2	9.3	22.9			1.0	0.0	1.4	1.1	2.7			1.6

Percentage difference (%) per vehicle		Percentage difference (%) per axle spacing	
Mean	2.2	Mean	1.9
S.D.(s)	0.6	S.D.(s)	1.3
Sample size	5	Sample Size	23

B.J.2.1 - AXLE SPACING MEASUREMENT ACCURACY

WOODBURN, OR
MAY 20, 1993

VEHICLE NO.	MEASURED AXLE SPACING (ft)							WIM AXLE SPACING (ft)							ABSOLUTE DIFFERENCE (ft)							VEHICLE ABS. DIFF.
	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7	
1	18.8	4.7	34.3	4.1				17.4	4.3	32.3	4.1				-1.4	-0.4	-2.0	0.0				-3.8
2	19.2	4.3	26.6	4.1				19.2	4.3	26.8	4.0				0.0	0.0	0.2	-0.1				0.1
3	14.9	4.4	28.9	4.1				15.1	4.2	28.7	4.0				0.2	-0.2	-0.2	-0.1				-0.3
4	11.3	4.3	17.2	4.3				11.3	4.4	17.1	4.2				0.0	0.1	-0.1	-0.1				-0.1
5	17.7	4.3	15.2	23.1				17.7	4.3	15.2	23.1				0.0	0.0	0.0	0.0				0.0
6	15.1	4.3	29.7	4.3				15.1	4.3	29.9	4.1				0.0	0.0	0.2	-0.2				0.0
7	17.8	4.3	31.9	4.2				18.0	4.2	31.8	4.0				0.2	-0.1	-0.1	0.2				-0.2
8	10.9	4.4	29.6	4.2				10.9	4.3	29.6	4.1				0.0	-0.1	0.0	0.1				-0.2
9	9.7	4.3	31.8	4.2				9.7	4.3	31.9	4.0				0.0	0.0	0.1	-0.2				-0.1
10	12.8	4.4	27.3	3.9	8.9	14.8	4.1	13.0	4.4	27.5	3.8	9.0	15.1	4.1	0.2	0.0	0.2	-0.1	0.1	0.3	0.0	0.7
11	17.4	4.4	26.5	4.3				17.7	4.4	26.9	4.2				0.3	0.0	0.4	-0.1				0.6
12	18.6	4.3	33.8	4.2				18.8	4.4	34.2	4.1				0.2	0.1	0.4	-0.1				0.6

Absolute difference per vehicle (ft)

Mean	-0.2
S.D.(s)	1.2
Sample size	12

Absolute difference per axle spacing (ft)

Mean	-0.1
S.D.(s)	0.4
Sample Size	51

(continued)

Continued

VEHICLE NO.	MEASURED AXLE SPACING (ft)							WIM AXLE SPACING (ft)							PERCENTAGE DIFFERENCE (%)							VEHICLE PERCNT. DIFF.
	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7	
1	18.8	4.7	34.3	4.1				17.4	4.3	32.3	4.1				-7.4	-8.5	-5.8	0.0				-6.1
2	19.2	4.3	26.6	4.1				19.2	4.3	26.8	4.0				0.0	0.0	0.8	-2.4				0.2
3	14.9	4.4	28.9	4.1				15.1	4.2	28.7	4.0				1.3	-4.5	-0.7	-2.4				-0.6
4	11.3	4.3	17.2	4.3				11.3	4.4	17.1	4.2				0.0	2.3	-0.6	-2.3				-0.3
5	17.7	4.3	15.2	23.1				17.7	4.3	15.2	23.1				0.0	0.0	0 0	0 0				0.0
6	15.1	4.3	29.7	4.3				15.1	4.3	29.9	4.1				0.0	0.0	0.7	-4.7				0.0
7	17.8	4.3	31.9	4.2				18.0	4.2	31.8	4.0				1.1	-2.3	-0.3	-4.8				-0.3
8	10.9	4.4	29.6	4.2				10.9	4.3	29.6	4.1				0.0	-2.3	0.0	-2.4				-0.4
9	9.7	4.3	31.8	4.2				9.7	4.3	31.9	4.0				0.0	0.0	0.3	-4.8				-0.2
10	12.8	4.4	27.3	3.9	8.9	14.8	4.1	13.0	4.4	27.5	3.8	9.0	15.1	4.1	1.6	0.0	0.7	-2.6	1.1	2.0	0.0	0.9
11	17.4	4.4	26.5	4.3				17.7	4.4	26.9	4.2				1.7	0.0	1.5	-2.3				1.1
12	18.6	4.3	33.8	4.2				18.8	4.4	34.2	4.1				1.1	2.3	1.2	-2.4				1.0

Percentage difference (%) per vehicle

Mean	-0.4
S.D.(s)	1.9
Sample size	12

Percentage difference (%) per axle spacing

Mean	-0.9
S.D.(s)	2.4
Sample Size	51

B.M.2.1 - AXLE SPACING MEASUREMENT ACCURACY

BOW HILL, WA
APRIL 14, 1993

VEHICLE NO.	MEASURED AXLE SPACING (ft)							WIM AXLE SPACING (ft)							ABSOLUTE DIFFERENCE (ft)							VEHICLE ABS. DIFF.
	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7	
1	13.4							13.5							-0.1							0.1
2	15.3	4.4	24.7	2.7	2.7			14.9	4.3	24.3	2.7	2.7			-0.4	-0.1	-0.4	0.0	0.0			-0.9
3	18.5	4.3	30.7	4.0				18.1	4.3	30.3	4.1				-0.4	0.0	-0.4	0.1				-0.7
4	13.6	4.3	32.8	4.2				13.4	4.2	32.6	4.1				-0.2	-0.1	-0.2	-0.1				-0.6
5	16.6	4.3						16.1	4.2						-0.5	-0.1						-0.6
6	14.8	4.3	25.7	4.0	9.8	9.2	4.4	14.4	4.3	25.6	4.0	9.7	9.2	4.4	-0.4	0.0	-0.1	0.0	-0.1	0.0	0.0	-0.6
7	12.0	4.3	17.3	9.2	20.8			11.7	4.2	16.9	9.1	20.5			-0.3	-0.1	-0.4	-0.1	-0.3			-1.2
8	18.8	4.3	21.5	19.2	4.1			18.3	4.2	21.3	19.0	4.1			-0.5	-0.1	-0.2	-0.2	0.0			-1.0
9	13.5							13.5							0.0							0.0
10	11.6	4.3	20.0	9.6	22.3			11.3	4.2	19.7	9.5	22.1			-0.3	-0.1	-0.3	-0.1	-0.2			-1.0

Absolute difference per vehicle (ft)	
Mean	-0.7
S.D.(s)	0.4
Sample size	10

Absolute difference per axle spacing (ft)	
Mean	-0.2
S.D.(s)	0.2
Sample Size	39

(continued)

Continued

VEHICLE NO.	MEASURED AXLE SPACING (ft)							WIM AXLE SPACING (ft)							PERCENTAGE DIFFERENCE (%)							VEHICLE PERCNT. DIFF.
	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7	
1	13.4							13.5							0.7							0.7
2	15.3	4.4	24.7	2.7	2.7			14.9	4.3	24.3	2.7	2.7			-2.6	-2.3	-1.6	0.0	0.0			-1.8
3	18.5	4.3	30.7	4.0				18.1	4.3	30.3	4.1				-2.2	0.0	-1.3	2.5				-1.2
4	13.6	4.3	32.8	4.2				13.4	4.2	32.6	4.1				-1.5	-2.3	-0.6	-2.4				-1.1
5	16.6	4.3						16.1	4.2						-3.0	-2.3						-2.9
6	14.8	4.3	25.7	4.0	9.8	9.2	4.4	14.4	4.3	25.6	4.0	9.7	9.2	4.4	-2.7	0.0	-0.4	0.0	-1.0	0.0	0.0	-0.8
7	12.0	4.3	17.3	9.2	20.8			11.7	4.2	16.9	9.1	20.5			-2.5	-2.3	-2.3	-1.1	-1.4			-1.9
8	18.8	4.3	21.5	19.2	4.1			18.3	4.2	21.3	19.0	4.1			-2.7	-2.3	-0.9	-1.0	0.0			-1.5
9	13.5							13.5							0.0							0.0
10	11.6	4.3	20.0	9.6	22.3			11.3	4.2	19.7	9.5	22.1			-2.6	-2.3	-1.5	-1.0	-0.9			-1.5

Percentage difference (%) per vehicle	
Mean	-1.2
S.D.(s)	1.0
Sample size	10

Percentage difference (%) per axle spacing	
Mean	-1.2
S.D.(s)	1.2
Sample Size	39

B.M.2.2 - AXLE SPACING MEASUREMENT ACCURACY

BOW HILL, WA
JUNE 25, 1993

VEHICLE NO.	MEASURED AXLE SPACING (ft)							WIM AXLE SPACING (ft)							ABSOLUTE DIFFERENCE (ft)							VEHICLE ABS. DIFF.
	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7	
1	13.3	4.3	30.5	4.1				13.5	4.3	30.5	4.1				0.2	0.0	0.0	0.0				0.2
2	19.8	4.3	19.5	17.8				19.9	4.3	19.4	17.7				0.1	0.0	-0.1	-0.1				-0.1
3	14.8	4.4	30.7	4.0				15.0	4.4	30.9	4.0				0.2	0.0	0.2	0.0				0.4
4	11.3	4.3	28.8	4.1				11.5	4.3	28.8	4.1				0.2	0.0	0.0	0.0				0.2
5	9.2	4.4	28.5	4.1				9.2	4.3	28.5	4.1				0.0	-0.1	0.0	0.0				-0.1
6	12.1	4.3	27.8	4.0				12.4	4.4	28.2	4.1				0.3	0.1	0.4	0.1				0.9

Absolute difference per vehicle (ft)	
Mean	0.3
S.D.(s)	0.4
Sample size	6

Absolute difference per axle spacing (ft)	
Mean	0.1
S.D.(s)	0.1
Sample Size	24

(continued)

Continued

VEHICLE NO.	MEASURED AXLE SPACING (ft)							WIM AXLE SPACING (ft)							PERCENTAGE DIFFERENCE (%)							VEHICLE PERCNT. DIFF.
	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7	
1	13.3	4.3	30.5	4.1				13.5	4.3	30.5	4.1				1.5	0.0	0.0	0.0				0.4
2	19.8	4.3	19.5	17.8				19.9	4.3	19.4	17.7				0.5	0.0	-0.5	-0.6				-0.2
3	14.8	4.4	30.7	4.0				15.0	4.4	30.9	4.0				1.4	0.0	0.7	0.0				0.7
4	11.3	4.3	28.8	4.1				11.5	4.3	28.8	4.1				1.8	0.0	0.0	0.0				0.4
5	9.2	4.4	28.5	4.1				9.2	4.3	28.5	4.1				0.0	-2.3	0.0	0.0				-0.2
6	12.1	4.3	27.8	4.0				12.4	4.4	28.2	4.1				2.5	2.3	1.4	2.5				1.9

Percentage difference (%) per vehicle

Mean	0.5
S.D.(s)	0.8
Sample size	6

Percentage difference (%) per axle spacing

Mean	0.5
S.D.(s)	1.1
Sample Size	24

B.O.2.1 - AXLE SPACING MEASUREMENT ACCURACY

SANTA NELLA, CA
MAY 7, 1993 LOW SPEED WIM

VEHICLE NO.	MEASURED AXLE SPACING (ft)							WIM AXLE SPACING (ft)							ABSOLUTE DIFFERENCE (ft)							VEHICLE ABS. DIFF.
	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7	
1	18.6	4.3	29.3	4.1				18.4	4.5	29.6	4.1				-0.2	0.3	0.4	0.0				0.4
2	19.0	4.3	31.3	4.1				19.4	4.5	31.9	4.1				0.4	0.3	0.6	0.0				1.2
3	12.6	21.0	9.3	22.0				12.8	21.5	9.6	22.3				0.2	0.5	0.4	0.3				1.4
4	17.2	4.3	30.2	10.1				17.3	4.2	30.3	10.0				0.1	-0.1	0.1	-0.1				0.1
5	16.6	4.3	31.8	4.0				16.9	4.5	32.5	4.1				0.3	0.3	0.8	0.1				1.4
6	15.0	4.3	31.3	4.1				15.5	4.4	32.1	4.0				0.5	0.2	0.9	-0.1				1.4
7	17.4	4.3	30.6	4.1				17.4	4.4	30.9	4.0				0.0	0.2	0.3	-0.1				0.4
8	9.1	4.3	33.7	4.1				9.1	4.4	34.3	4.0				0.0	0.1	0 6	-0.1				0.7
9	10.3	20.3	9.3	21.3				10.5	20.9	9.5	22.3				0.3	0.7	0.3	1.0				2.1
10	11.2	4.3	30.5	4.0				11.5	4.2	31.3	4.0				0.3	-0.1	0.8	0.0				1.1
11	10.1	21.3						10.0	21.4						-0.1	0.2						0.1
12	16.3	4.3	30.4	4.1				16.1	4.5	30.9	4.0				-0.2	0.2	0.5	-0.1				0.4
13	17.4	4.3	20.4	17.2				17.4	4.2	20.4	17.5				0.0	-0.1	0.0	0.3				0.2
14	12.0	4.3	33.2	4.1				12.0	4.2	33.4	4.1				0.0	-0.1	0.2	0.0				0.2
15	15.1	4.3		9.3				15.3	4.5		9.7				0.2	0.2		0.4				0.8

Absolute difference per vehicle (ft)

Mean	0.8
S.D.(s)	0.6
Sample size	15

Absolute difference per axle spacing (ft)

Mean	0.2
S.D.(s)	0.3
Sample Size	57

(continued)

Continued

VEHICLE NO.	MEASURED AXLE SPACING (ft)							WIM AXLE SPACING (ft)							PERCENTAGE DIFFERENCE (%)							VEHICLE PERCNT. DIFF.
	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7	
1	18.6	4.3	29.3	4.1				18.4	4.5	29.6	4.1				-1.0	5.9	1.2	0 5				0.8
2	19.0	4.3	31.3	4.1				19.4	4 5	31.9	4 1				2 1	5.9	1.8	0.5				2.1
3	12.6	21.0	9.3	22.0				12 8	21.5	9 6	22 3				1.7	2.4	3.8	1.4				2.1
4	17.2	4.3	30.2	10.1				17.3	4.2	30.3	10 0				0.8	-3.0	0.5	-0.8				0.1
5	16.6	4.3	31.8	4.0				16.9	4.5	32.5	4 1				1.9	5.9	2.4	2.5				2 5
6	15.0	4.3	31.3	4.1				15.5	4 4	32.1	4 0				3.3	3.5	2.7	-2.0				2.6
7	17.4	4.3	30.6	4.1				17.4	4.4	30.9	4 0				-0.1	3.5	1.0	-2.0				0.7
8	9.1	4.3	33.7	4.1				9.1	4.4	34.3	4 0				0.2	1.6	1.9	-2.0				1.3
9	10.3	20.3	9.3	21.3				10.5	20.9	9.5	22.3				2.4	3.2	2.7	4.5				3.5
10	11.2	4.3	30.5	4.0				11.5	4.2	31.3	4.0				3.0	-1.2	2.6	0.0				2.2
11	10.1	21.3						10.0	21.4						-0.8	0.7						0.2
12	16.3	4.3	30.4	4.1				16.1	4.5	30.9	4.0				-0.9	3.9	1.6	-2.0				0.8
13	17.4	4.3	20.4	17.2				17.4	4.2	20.4	17.5				-0.1	-3.0	-0.1	2.0				0.3
14	12.0	4.3	33.2	4.1				12.0	4.2	33.4	4.1				0.0	-1.2	0.7	0.5				0.4
15	15.1	4.3		9.3				15.3	4.5		9.7				1.5	3.9		4.0				2.6

Percentage difference (%) per vehicle

Mean	1.5
S.D.(s)	1.1
Sample size	15

Percentage difference (%) per axle spacing

Mean	1.3
S.D.(s)	2.2
Sample Size	57

Note: Reading 3 for vehicle no. 15 has been rejected, as it is considered abnormal. The manual measurement is 19.6 ft and the WIM reading is 28.2 ft. This gives an absolute difference of 8.6 ft, which is 35 s.d. from the mean of all the other observations.

B.O.2.2 - AXLE SPACING MEASUREMENT ACCURACY

SANTA NELLA, CA
JUNE 29, 1993 LOW SPEED WIM

VEHICLE NO.	MEASURED AXLE SPACING (ft)							WIM AXLE SPACING (ft)							ABSOLUTE DIFFERENCE (ft)							VEHICLE ABS. DIFF.
	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7	
1	18.3	4.3	27.3	4.1				17.4	4.2	26.5	4.0				-0.9	-0.1	-0.8	-0.1				-1.9
2	11.3	4.4	29.0	4.2				12.0	4.4	29.9	4.1				0.7	0.0	0.9	-0.1				1.5
3	19.6	4.4	29.1	4.1				19.3	4.1	25.8	3.8				-0.3	-0.3	-3.3	-0.3				-4.2
4	16.2	4.4	34.6	4.1				15.5	4.1	32.0	3 7				-0.7	-0.3	-2.6	-0.4				-4.0
5	16.2	4.3	33.8	4.2				14.4	3.9	31.4	3.9				-1.8	-0.4	-2.4	-0.3				-4.9
6	17.6	4.4	33.3	4.1				17.2	4.2	32.4	3.9				-0.4	-0.2	-0.9	-0.2				-1.7
7	18.0	4.3	28.8	4.1				18.0	4.1	28.6	4.0				0.0	-0.2	-0.2	-0.1				-0.5
8	13.2	4.4	35.3	4.2				13.2	4.3	36.8	4 0				0.0	-0.1	1.5	-0.2				1.2
9	17.1	4.4	32.9	4.2				16.1	4.1	29.9	3.8				-1.0	-0.3	-3.0	-0.4				-4.7
10	13.6	20.9	10.3	21.6				13.2	20.8	10.2	21.9				-0.4	-0.1	-0.1	0.3				-0.3
11	18.8	4.5	30.7	4.2				18.2	4.3	30.0	4.0				-0.6	-0.2	-0.9	-0.2				-1.9
12	15.2	4.4	32.9	4.1				15.0	4.3	32.4	4.0				-0.2	-0.1	-0.5	-0.1				-0.9
13	17.7	4.3	32.0	4.2				16.8	4.1	31.0	4.0				-0.9	-0.2	-1.0	-0.2				-2.3
14	11.2	4.4	20.5	9.8	22.0			11.2	4.3	23.4	10.6	24.0			0.0	-0.1	2.9	0.8	1.6			5.2
15	11.3	4.5	17.5					10.6	4.0	17.1					0.7	-0.5	-0.4					-1.6
16	19.5	4.4	30.9	4.2				20.0	4.3	34.0	4 2				0.5	-0.1	3 1	0.0				3.5
17	12.2	4.4	32.5	4.2				13.0	4.5	35.0	4.1				0.8	0.1	2.9	-0.1				3.7
18	11.8	16.3	11.7	17.0				11.0	15.0	13.0	20.0				-1.0	-0.9	0.8	2.5				1.4
19	11.1	21.9	11.0	21.6				12.0	23.0	11.0	21.0				0.7	0.9	-0.1	-0.2				1.3
20	14.5	4.4	33.0	4.1				14.0	4.3	34.0	4.1				-0.2	-0.1	0.8	0.0				0.5

(continued)

Continued

VEHICLE NO.	MEASURED AXLE SPACING (ft)							WIM AXLE SPACING (ft)							PERCENTAGE DIFFERENCE (%)							VEHICLE PERCNT. DIFF.
	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7	
1	18.3	4.3	27.3	4.1				17.4	4.2	26.5	4.0				-4.9	-2.3	-2.9	-2.4				-3.5
2	11.3	4.4	29.0	4.2				12.0	4.4	29.9	4.1				6.2	0.0	3.1	-2.4				3.1
3	19.6	4.4	29.1	4.1				19.3	4.1	25.8	3 8				-1.5	-6.8	-11.3	-7.3				-7.3
4	16.2	4.4	34.6	4.1				15.5	4.1	32.0	3.7				-4.3	-6.8	-7.5	-9.8				-6.7
5	16.2	4.3	33.8	4.2				14.4	3.9	31.4	3.9				-11.1	-9.3	-7.1	-7.1				-8.4
6	17.6	4.4	33.3	4.1				17.2	4.2	32.4	3.9				-2.3	-4.5	-2.7	-4.9				-2.9
7	18.0	4.3	28.8	4.1				18.0	4.1	28.6	4.0				0.0	-4.7	-0.7	-2.4				-0.9
8	13.2	4.4	35.3	4.2				13.2	4.3	36.8	4.0				0.0	-2.3	4.2	-4.8				2.1
9	17.1	4.4	32.9	4.2				16.1	4.1	29.9	3.8				-5.8	-6.8	-9.1	-9.5				-8.0
10	13.6	20.9	10.3	21.6				13.2	20.8	10.2	21 9				-2.9	-0.5	-1.0	1.4				-0.5
11	18.8	4.5	30.7	4.2				18.2	4.3	30.0	4.0				-3.2	-4.4	-2.9	-4.8				-3.3
12	15.2	4.4	32.9	4.1				15.0	4.3	32.4	4.0				-1.3	-2.3	-1.5	-2.4				-1.6
13	17.7	4.3	32.0	4.2				16.8	4.1	31.0	4.0				-5.1	-4.7	-3.1	-4.8				-4.0
14	11.2	4.4	20.5	9.8	22			11.2	4.3	23.4	10.6	24.0			0.0	-2.3	14.1	8.2	7.1			7.6
15	11.3	4.5	17.5					10.6	4.0	17.1					-6.2	-11.1	-2.3					-4.8
16	19.5	4.4	30.9	4.2				20.0	4.3	34.0	4.2				2.6	-2.3	10.0	0.0				5.9
17	12.2	4.4	32.5	4.2				13.0	4.5	35.0	4.1				6.6	2.3	8.9	-2.4				6.9
18	11.8	16.3	11.7	17.0				11.0	15.0	13.0	20.0				-8 5	-5.5	6.8	14.7				2.5
19	11.1	21.9	11.0	21.6				12.0	23.0	11.0	21.0				6.3	4.1	-0.9	-0.9				2.0
20	14.5	4.4	33.0	4.1				14.0	4.3	34.0	4.1				-1.4	2.3	2.4	0.0				0.9

(Continued)

Continued

Absolute difference per vehicle (ft)		Absolute difference per axle spacing (ft)	
Mean	-0.5	Mean	-0.1
S.D.(s)	2.8	S.D.(s)	1.1
Sample size	20	Sample Size	80

Percentage difference (%) per vehicle		Percentage difference (%) per axle spacing	
Mean	-1.0	Mean	-1.8
S.D.(s)	4.9	S.D.(s)	5.4
Sample size	20	Sample Size	80

B.O.2.3 - AXLE SPACING MEASUREMENT ACCURACY

SANTA NELLA, CA
JUNE 30, 1993 LOW SPEED WIM

VEHICLE NO.	MEASURED AXLE SPACING (ft)							WIM AXLE SPACING (ft)							ABSOLUTE DIFFERENCE (ft)							VEHICLE ABS. DIFF.
	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7	
1	18.1	4.4	31.4	4.2				17.5	4.1	30.1	4.0				-0.6	-0.3	-1.3	-0.2				-2.4
2	11.8	16.9	10.9	17.8				11.4	16.0	10.6	17.7				-0.4	-0.9	-0.3	-0.1				-1.7
3	12.9	4.4	31.1	4.0				12.7	4.2	30.7	3.9				-0.2	-0.2	-0.4	-0.1				-0.9
4	12.4	4.3	25.2	9.1				12.3	4.3	25.3	9.2				-0.1	0.0	0.1	0.1				0.1
5	19.7	4.3	31.0	4.1				18.6	4.1	30.3	3.9				1.1	-0.2	-0.7	-0.2				-2.2
6	15.8							15.4							-0.4							-0.4
7	11.7	16.1	13.3	15.9				10.3	15.1	12.8	14.8				-1.4	-1.0	-0.5	-1.1				-4.0
8	10.4	4.3	28.9	4.1				9.2	3.8	26.0	3.8				-1.2	-0.5	-2.9	-0.3				-4.9
9	16.1	17.1	12.8	16.8				15.4	15.4	11.1	14.0				-0.7	-1.7	-1.7	-2.8				-6.9
10	15.9	4.3	27.2	4.2				15.6	4.3	27.6	4.0				-0.3	0.0	0.4	-0.2				-0.1
11	13.2	4.3	27.6	4.1				12.3	4.4	28.6	4.1				-0.9	0.1	1.0	0.0				0.2
12	10.1	17.3	10.5	17.1				9.4	16.0	10.0	16.8				-0.7	-1.3	-0.5	-0.3				-2.8
13	13.4	4.3	30.5	4.1				12.8	4.1	28.6	3.9				-0.6	-0.2	-1.9	-0.2				-2.9
14	17.5	4.3	19.9	10.0	22.8			16.3	4 1	20.6	10.8	25			-1.2	-0.2	0.7	0.8	2.2			2.3
15	18.6	4.5	31.2	4.1				17.0	4.1	30.0	4.0				-1.6	-0.4	-1.2	-0.1				-3.3

(continued)

Continued

VEHICLE NO.	MEASURED AXLE SPACING (ft)							WIM AXLE SPACING (ft)							ABSOLUTE DIFFERENCE (ft)							VEHICLE ABS. DIFF.
	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7	
15	18.6	4.5	31.2	4.1				17.0	4.1	30.0	4.0				-1.6	-0.4	-1.2	-0.1				-3.3
16	10.3	4.5	27.7	4.1				10.3	4.5	32.4	4.2				0.0	0.0	4.7	0.1				4.8
17	11.8	18.2	10.8	20.2				12.3	19.3	11.0	20.9				0.5	1.1	0.2	0.7				2.5
18	11.3	17.4						10.9	26.6						-0.4	9.2						8.8
19	15.0	4.4	32.0	4.1				14.8	4.1	28.7	3.9				-0.2	-0.3	-3.3	-0.2				-4.0
20	15.5							15.0							-0.5							-0.5
21	10.5	18.3	9.4	18.3				9.8	17.9	9.3	18.1				-0.7	-0.4	-0.1	-0.2				-1.4
22	14.3	17.6	11.0	18.0				14.0	18.1	11.4	19.3				-0.3	0.5	0.4	1.3				1.9
23	16.1	4.2	32.0	4.1				15.5	4.1	32.6	4.1				-0.6	-0.1	0.6	0.0				-0.1
24	11.9	18.3	10.4	20.1				10.8	16.0	9.9	18.9				-1.1	-2.3	-0.5	-1.2				-5.1
25	18.7	4.3	28.7	4.1				20	4.5	29	4.0				1.3	0.2	0.3	-0.1				1.7

Absolute difference per vehicle (ft)	
Mean	-0.9
S.D.(s)	3.4
Sample size	25

Absolute difference per axle spacing (ft)	
Mean	-0.2
S.D.(s)	1.4
Sample Size	93

(Continued)

Continued

VEHICLE NO.	MEASURED AXLE SPACING (ft)							WIM AXLE SPACING (ft)							PERCENTAGE DIFFERENCE (%)							VEHICLE PERCNT. DIFF.
	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7	
1	18.1	4.4	31.4	4.2				17.5	4.1	30.1	4.0				-3.3	-6.8	-4.1	-4.8				-4.1
2	11.8	16.9	10.9	17.8				11.4	16.0	10.6	17.7				-3.4	-5.3	-2.8	-0.6				-3.0
3	12.9	4.4	31.1	4.0				12.7	4.2	30.7	3.9				-1.6	-4.5	-1.3	-2.5				-1.7
4	12.4	4.3	25.2	9.1				12.3	4.3	25.3	9.2				-0.8	0.0	0.4	1.1				0.2
5	19.7	4.3	31.0	4.1				18.6	4.1	30.3	3.9				-5.6	-4.7	-2.3	-4.9				-3.7
6	15.8							15.4							-2.5							-2.5
7	11.7	16.1	13.3	15.9				10.3	15.1	12.8	14.8				-12.0	-6.2	-3.8	-6.9				-7.0
8	10.4	4.3	28.9	4.1				9.2	3.8	26.0	3.8				-11.5	-11.6	10.0	-7.3				-10.3
9	16.1	17.1	12.8	16.8				15.4	15.4	11.1	14.0				-4.3	-9.9	-13.3	-16.7				-11.0
10	15.9	4.3	27.2	4.2				15.6	4.3	27.6	4.0				-1.9	0.0	1.5	-4.8				-0.2
11	13.2	4.3	27.6	4.1				12.3	4.4	28.6	4.1				-6.8	2.3	3.6	0.0				0.4
12	10.1	17.3	10.5	17.1				9.4	16.0	10.0	16.8				-6.9	-7.5	-4.8	-1.8				-5.1
13	13.4	4.3	30.5	4.1				12.8	4.1	28.6	3.9				-4.5	-4.7	-6.2	-4.9				-5.5
14	17.5	4.3	19.9	10.0	22.8			16.3	4.1	20.6	10.8	25			-6.9	-4.7	3.5	8.0	9.6			3.1
15	18.6	4.5	31.2	4.1				17.0	4.1	30.0	4.0				-8.6	-8.9	-3.8	-2.4				-5.7

(continued)

Continued

VEHICLE NO.	MEASURED AXLE SPACING (ft)							WIM AXLE SPACING (ft)							PERCENTAGE DIFFERENCE (%)							VEHICLE PERCNT. DIFF.
	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7	
16	10.3	4.5	27.7	4.1				10.3	4.5	32.4	4 2				0.0	0.0	17.0	2.4				10.3
17	11.8	18.2	10.8	20.2				12.3	19.3	11.0	20.9				4.2	6.0	1.9	3.5				4.1
18	11.3	17.4						10.9	26.6						-3.5	52.9						30.7
19	15.0	4.4	32.0	4.1				14.8	4.1	28.7	3.9				-1.3	-6.8	-10.3	-4.9				-7.2
20	15.5							15.0							-3.2							-3.2
21	10.5	18.3	9.4	18.3				9.8	17.9	9.3	18.1				-6.7	-2.2	-1.1	-1.1				-2.5
22	14.3	17.6	11.0	18.0				14.0	18.1	11.4	19.3				-2.1	2.8	3.6	7.2				3.1
23	16.1	4.2	32.0	4.1				15.5	4.1	32.6	4.1				-3.7	-2.4	1.9	0.0				-0.2
24	11.9	18.3	10.4	20.1				10.8	16.0	9.9	18.9				-9.2	-12.6	-4.8	-6.0				-8.4
25	18.7	4.3	28.7	4.1				20	4.5	29	4.0				7.0	4.7	1.0	-2.4				3.0

Percentage difference (%) per vehicle

Mean	-1.1
S.D.(s)	8.2
Sample size	25

Percentage difference (%) per axle spacing

Mean	-2.2
S.D.(s)	7.9
Sample Size	93

WEIGH-IN-MOTION ANALYSIS

This section presents the results of the WIM equipment accuracy assessment. This assessment compared static axle, axle combinations and gross vehicle weights to the equivalent weight measured dynamically by the WIM on a vehicle-by-vehicle basis.

For each evaluation visit, the results are presented for both axle and gross vehicle weight. Tables show the absolute and percentage differences between static and dynamic weights in a series of weight ranges, and the calculated figures required to undertake a F test present results from the weight range analysis and gross vehicle weights. F tests are performed to identify significant differences between the mean percentage differences of each weight range. If significant differences are found between the means of each weight range, it can be concluded that there is a change in calibration with a changing vehicle weight. A third set of tables shows the results from t-tests that are performed between individual weight ranges. The t-test illustrates if the mean percentage differences of the pair of weight ranges are significantly different, enabling the nature of differences between weight range accuracies to be established.

Results for the following sites are presented:

* Jefferson,
* Ashland
* Bakersfield,
* South Phoenix,
* Kelso,
* Woodburn,
* Bow Hill, and
* Santa Nella.

WEIGH-IN-MOTION ANALYSIS

JEFFERSON, WA - APRIL 7, 1993

TABLE B.A.3.1 - WEIGHT RANGE ANALYSIS FOR AXLES

Weight Range	Sample Size	Percentage Difference (%)		Absolute Difference (x 1000 lbs)	
		Mean	S.D.	Mean	S.D.
Less than 10,000 lbs	7	17.4	30.8	1.4	2.3
10,000 - 19,999 lbs	43	1.6	14.9	0.2	2.0
20,000 - 29,999 lbs	15	8.2	10.1	2.0	2.6
30,000 - 39,999 lbs	42	9.9	11.8	3.3	3.9
TOTAL	107	6.8	15.2	1.7	3.3

Mean absolute difference below 10,000 lbs is 1,400 lbs with a standard deviation is 2,300 lbs.

Mean percentage difference above 10,000 lbs is 6.1% with a standard deviation is 13.5%.

TABLE B.A.3.2 - F-TEST DATA FOR AXLE WEIGHTS

Weight Range	Sample Size	Percentage Difference (%)		$\frac{\sum (PD)^2}{N}$	$\sum (PD^2)$
		Sum	Mean		
Less than 10,000 lbs	7	121.9	17.4	2122.9	7801.9
10,000 - 19,999 lbs	43	67.6	1.6	106.2	9469.9
20,000 - 29,999 lbs	15	123.0	8.2	1009.2	2431.4
30,000 - 39,999 lbs	42	417.5	9.9	4150.2	9882.9
TOTALS	107	730.0	6.8	7388.6	29586.2

K = No. of classes = 4

Estimate of population variance based entirely on scatter between the group means:

$S_b^2 = 802.6$

Estimate of population variance based entirely on scatter among scores within the groups:

$$S_w^2 = 215.5$$

$$\frac{S_b^2}{S_w^2} = \frac{802.6}{215.5} = 3.73$$

F value at 5% significance level = 2.70. Therefore at the 5% level reject the null hypothesis and conclude that there is a significant difference between the sample means.

TABLE B.A.3.3 - WEIGHT RANGE ANALYSIS FOR TRUCK WEIGHTS

Weight Range	Sample Size	Percentage Difference (%)		Absolute Difference (x 1000 lbs)	
		Mean	S.D.	Mean	S.D.
Less than 60,000 lbs	6	11.0	16.7	4.2	6.1
60,000 - 69,999 lbs	3	0.9	13.6	0.7	8.5
70,000 - 79,999 lbs	21	9.6	10.7	7.3	8.3
More than 80,000 lbs	3	0.4	9.2	0.8	9.2
TOTAL	33	8.2	12.0	5.6	8.1

TABLE B.A.3.4 - F-TEST DATA FOR TRUCK WEIGHTS

Weight Range	Sample Size	Percentage Difference (%)		$\frac{\sum (PD)^2}{N}$	$\sum (PD^2)$
		Sum	Mean		
Less than 60,000 lbs	6	65.7	11.0	720.5	2109.3
60,000 - 69,999 lbs	3	2.7	0.9	2.5	369.8
70,000 - 79,999 lbs	21	201.5	9.6	1932.8	4216.6
More than 80,000 lbs	3	1.1	0.4	0.4	169.2
TOTAL	33	271.0	8.2	2656.1	6864.9

K = No. of classes = 4

Estimate of population variance based entirely on scatter between the group means:

$$S_b^2 = 143.4$$

Estimate of population variance based entirely on scatter among scores within the groups:

$$S_w^2 = 145.1$$

$$\frac{S_b^2}{S_w^2} = \frac{143.4}{145.1} = 0.99$$

F value at 5% significance level = 2.93. Therefore at the 5% level reject the null hypothesis and conclude that there is a significant difference between the sample means.

TABLE B.A.3.5 - COMPARISON OF INDIVIDUAL AXLE WEIGHT RANGES

Weight Ranges (lbs)	V1	V2	S1	S2	F	F (5%)	F (1%)	
0-9,999 / 10,000-19,999	6	42	33.4	14.8	5.1	2.3	3.3	++
0-9,999 / 20,000-29,999	6	14	33.4	12.7	6.9	2.9	4.5	++
0-9,999 / 30,000-39,999	6	41	33.4	15.3	4.7	2.3	3.3	++
10,000-19,999 / 20,000-29,999	42	14	14.8	12.7	1.4	2.3	3.3	
30,000-39,999 / 10,000-19,999	41	41	15.3	14.8	1.1	1.7	2.1	
30,000-39,999 / 10,000-19,999	41	14	15.3	12.7	1.5	1.5	3.3	

TABLE B.A.3.6 - COMPARISON OF INDIVIDUAL TRUCK WEIGHT RANGES

Weight Ranges (lbs)	V1	V2	S1	S2	F	F (5%)	F (1%)	
0-59,999 / 60,000-69,999	5	2	18.8	11.1	2.9	19.3	99.3	
0-59,999 / 70,000-79,999	5	20	18.8	11.3	2.8	2.7	4.1	+
0-59,000 / 80,000-	5	2	18.8	7.5	6.3	19.3	99.3	
70,000-79,999 / 60,000-69,999	2	20	14.2	11.1	1.6	3.5	5.9	
60,000-69,999 / 80,000-	2	2	11.1	7.5	2.2	19.0	99,0	
70,000-79,999 / 80,000-	20	2	14.2	7.5	3.6	19.0	99.4	

ASHLAND, OR - APRIL 5, 1993

TABLE B.B.3.1 - WEIGHT RANGE ANALYSIS FOR AXLES

Weight Range	Sample Size	Percentage Difference (%)		Absolute Difference (x 1000 lbs)	
		Mean	S.D.	Mean	S.D.
Less than 10,000 lbs	16	-0.5	17.0	-0.0	1.5
10,000 - 19,999 lbs	98	1.1	9.9	0.1	1.4
20,000 - 29,999 lbs	20	4.2	5.9	1.0	1.5
30,000 - 39,999 lbs	25	3.4	4.2	1.1	1.4
TOTAL	159	1.7	9.8	0.4	1.5

Mean absolute difference below 10,000 lbs is -500 lbs with a standard deviation of 17,000 lbs.

Mean percentage difference above 10,000 lbs is 1.9% with a standard deviation of 8.7%.

TABLE B.B.3.2 - F-TEST DATA FOR AXLE WEIGHTS

Weight Range	Sample Size	Percentage Difference (%)		$\frac{\sum (PD)^2}{N}$	$\sum (PD^2)$
		Sum	Mean		
Less than 10,000 lbs	16	-7.8	-0.5	3.8	4350.9
10,000 - 19,999 lbs	98	106.0	1.1	114.6	9526.6
20,000 - 29,999 lbs	20	83.6	4.2	349.8	1008.4
30,000 - 39,999 lbs	25	84.2	3.4	283.4	707.0
TOTALS	159	266.0	1.7	751.5	15593.0

Number of classes = K = 4

Estimate of population variance based entirely on scatter between the group means:

$S_b^2 = 102.2$

Estimate of population variance based entirely on scatter among scores within the groups:

$S_w^2 = 95.8$

$$\frac{S_b^2}{S_w^2} = \frac{102.2}{95.8} = 1.07$$

F value at 5% significance level = 2.60. Therefore at the 5% level reject the null hypothesis and conclude that there is no significant difference between the sample means.

TABLE B.B.3.3 - WEIGHT RANGE ANALYSIS FOR TRUCKS

Weight Range	Sample Size	Percentage Difference (%)		Absolute Difference (x 1000 lbs)	
		Mean	S.D.	Mean	S.D.
Less than 49,999 lbs	8	1.4	7.8	1.0	2.9
50,000 - 59,999 lbs	9	5.2	4.4	2.8	2.3
60,000 - 69,999 lbs	14	-0.2	4.3	-0.1	2.8
More than 70,000 lbs	14	2.1	4.3	1.6	3.2
TOTAL	45	1.9	5.3	1.2	3.0

TABLE B.B.3.4 - F-TEST DATA FOR TRUCK WEIGHTS

Weight Range	Sample Size	Percentage Difference (%)		$\frac{\sum (PD)^2}{N}$	$\sum (PD^2)$
		Sum	Mean		
Less than 49,999 lbs	8	11.5	1.4	16.4	440.3
50,000 - 59,999 lbs	9	47.1	5.2	246.5	402.3
60,000 - 69,999 lbs	14	-2.9	-0.2	0.6	241.9
More than 70,000 lbs	14	28.9	2.1	59.6	294.6
TOTAL	45	84.6	1.9	323.1	1379.4

Number of classes = K = 4

Estimate of population variance based entirely on scatter between the group means:

$S_b^2 = 54.7$

Estimate of population variance based entirely on scatter among scores within the groups:

$S_w^2 = 2.12$

$$\frac{S_b^2}{S_w^2} = \frac{54.7}{25.8} = 2.12$$

F value at 5% significance level = 2.84. Therefore at the 5% level reject the null hypothesis and conclude that there is no significant difference between the sample means.

TABLE B.B.3.5 - COMPARISON OF INDIVIDUAL AXLE WEIGHT RANGES

Weight Ranges (lbs)	V1	V2	S1	S2	F	F (5%)	F (1%)	
0-9,999 / 10,000-19,999	15	97	16.5	9.9	2.8	1.8	2.3	++
0-9,999 / 20,000-29,999	15	19	16.5	7.1	5.4	2.2	3.2	++
0-9,999 / 30,000-39,999	15	24	16.5	5.3	9.7	2.1	2.9	++
10,000-19,999 / 20,000-29,999	97	19	9.9	7.1	1.9	2.0	2.6	
10,000-19,999 / 30,000-39,999	97	24	9.9	5.3	3.5	1.8	2.4	++
20,000-29,999 / 30,000-39,999	19	24	7.1	5.3	1.8	2.0	2.7	

TABLE B.B.3.6 - COMPARISON OF INDIVIDUAL TRUCK WEIGHT RANGES

Weight Ranges (lbs)	V1	V2	S1	S2	F	F (5%)	F (1%)	
0-49,999 / 50,000-59,999	7	8	7.4	6.7	1.2	3.5	6.2	
0-49,999 / 60,000-69,999	7	13	7.4	4.2	3.1	2.8	4.4	+
0-49,000 / 70,000-	7	13	7.4	4.6	2.6	2.8	4.4	
50,000-59,999 / 60,000-69,999	8	13	6.7	4.2	2.5	2.8	4.3	+
50,000-59,999 / 70,000-	8	13	6.7	4.6	2.1	2.8	4.3	
70,000- / 60,000-69,999	13	13	4.6	4.2	1.2	2.6	4.0	

BAKERSFIELD, CA - APRIL 16, 1993

TABLE B.C.3.1 - WEIGHT RANGE ANALYSIS FOR AXLES

Weight Range	Sample Size	Percentage Difference (%)		Absolute Difference (x 1000 lbs)	
		Mean	S.D.	Mean	S.D.
Less than 10,000 lbs	12	-5.2	12.6	-0.4	1.1
10,000 - 19,999 lbs	26	0.3	14.1	0.1	1.8
20,000 - 29,999 lbs	6	-2.5	4.6	-0.7	1.3
30,000 - 39,999 lbs	11	-3.3	8.4	-1.2	2.8
TOTAL	55	-1.9	12.0	-0.4	1.9

Mean absolute difference below 10,000 lbs is -400 lbs with a standard deviation of 1,100 lbs.

Mean percentage difference above 10,000 lbs is -1.0% with a standard deviation of 11.8%.

TABLE B.C.3.2 - F-TEST DATA FOR AXLE WEIGHTS

Weight Range	Sample Size	Percentage Difference (%)		$\frac{\sum (PD)^2}{N}$	$\sum (PD^2)$
		Sum	Mean		
Less than 10,000 lbs	12	-62.6	-5.2	326.6	2075.7
10,000 - 19,999 lbs	26	8.5	0.3	2.8	4951.7
20,000 - 29,999 lbs	6	-14.8	-2.5	36.6	141.6
30,000 - 39,999 lbs	11	-36.4	-3.3	120.3	882.9
TOTALS	55	-105.3	-1.9	486.2	7991.9

K = No. of classes = 4

Estimate of population variance based entirely on scatter between the group means:

$S_b^2 = 94.9$

Estimate of population variance based entirely on scatter among scores within the groups:

$S_w^2 = 147.2$

$$\frac{S_b^2}{S_w^2} = \frac{94.9}{147.2} = 0.64$$

F value at 5% significance level = 2.80. Therefore at the 5% level reject the null hypothesis and conclude that there is no significant difference between the sample means.

TABLE B.C.3.3 - WEIGHT RANGE ANALYSIS FOR TRUCKS

Weight Range	Sample Size	Percentage Difference (%)		Absolute Difference (x 1000 lbs)	
		Mean	S.D.	Mean	S.D.
Less than 50,000 lbs	4	-4.8	6.5	-1.2	2.2
50,000 - 59,999 lbs	2	-0.6	2.2	-0.3	1.3
60,000 - 69,999 lbs	2	-6.2	3.2	-4.3	2.3
More than 70,000 lbs	8	-1.0	6.0	-0.9	4.6
TOTAL	16	-2.5	5.6	-1.3	3.5

TABLE B.C.3.4 - F-TEST DATA FOR TRUCK WEIGHTS

Weight Range	Sample Size	Percentage Difference (%)		$\frac{\sum (PD)^2}{N}$	$\sum (PD^2)$
		Sum	Mean		
Less than 50,000 lbs	4	-19.0	-4.8	90.3	215.3
50,000 - 59,999 lbs	2	-1.1	-0.6	0.6	5.5
60,000 - 69,999 lbs	2	-12.4	-6.2	76.3	86.3
More than 70,000 lbs	8	-7.7	-1.0	7.4	259.8
TOTAL	16	-40.2	-2.5	174.6	566.9

K = No. of classes = 4

Estimate of population variance based entirely on scatter between the group means:

$S_b^2 = 24.6$

Estimate of population variance based entirely on scatter among scores within the groups:

$S_w^2 = 32.7$

$$\frac{S_b^2}{S_w^2} = \frac{24.6}{32.7} = 0.75$$

F value at 5% significance level = 3.26. Therefore at the 5% level reject the null hypothesis and conclude that there is no significant difference between the sample means.

TABLE B.C.3.5 - COMPARISON OF INDIVIDUAL AXLE WEIGHT RANGES

Weight Ranges (lbs)	V1	V2	S1	S2	F	F (5%)	F (1%)	
10,000-19,999 / 0-9,999	25	11	13.8	13.2	1.1	2.6	4.0	
0-9,999 / 20,000-29,999	11	5	13.2	4.9	7.3	4.7	10.0	+
0-9,999 / 30,000-39,999	11	10	13.2	8.7	2.3	3.0	4.8	
10,000-19,999 / 20,000-29,999	25	5	13.8	4.9	8.1	4.5	9.5	+
30,000-39,999 / 10,000-19,999	25	10	13.8	8.7	2.5	2.7	4.3	
30,000-39,999 / 10,000-19,999	10	5	8.6	4.9	3.2	4.7	10.1	

TABLE B.C.3.6 - COMPARISON OF INDIVIDUAL TRUCK WEIGHT RANGES

Weight Ranges (lbs)	V1	V2	S1	S2	F	F (5%)	F (1%)	
0-49,999 / 50,000-59,999	3	1	7.3	1.7	19.3	216.0	5403.0	
0-49,999 / 60,000-69,999	3	1	7.3	6.6	1.2	216.0	5403.0	
0-49,000 / 70,000-	3	7	7.3	5.7	1.6	4.4	8.5	
60,000-79,999 / 50,000-59,999	1	1	6.6	1.7	15.7	161.0	4052.0	
70,000- / 50,000-59,999	7	1	5.7	1.7	11.8	237.0	5928.0	
60,000-69,999 / 70,000-	1	7	6.6	5.7	1.3	5.6	12.2	

S. PHEONIX, AZ - MARCH 25, 1993

TABLE B.D.3.1 - WEIGHT RANGE ANALYSIS FOR AXLES

Weight Range	Sample Size	Percentage Difference (%)		Absolute Difference (x 1000 lbs)	
		Mean	S.D.	Mean	S.D.
Less than 10,000 lbs	25	-7.0	14.5	-0.6	1.2
10,000 - 19,999 lbs	47	-7.6	14.3	-1.0	1.9
20,000 - 29,999 lbs	6	-10.4	9.9	-2.4	2.2
30,000 - 39,999 lbs	14	-11.6	6.8	-3.9	2.3
TOTAL	92	-8.2	13.2	-1.4	2.1

Mean absolute difference below 10,000 lbs is -600 lbs with a standard deviation of 1,200 lbs.

Mean percentage difference above 10,000 lbs is -8.7% with a standard deviation of 12.7%.

TABLE B.D.3.2 - F-TEST DATA FOR AXLE WEIGHTS

Weight Range	Sample Size	Percentage Difference (%)		$\frac{\sum (PD)^2}{N}$	$\sum (PD^2)$
		Sum	Mean		
Less than 10,000 lbs	25	-176.1	-7.0	1239.8	6266.7
10,000 - 19,999 lbs	47	-357.1	-7.6	2713.0	12141.7
20,000 - 29,999 lbs	6	-62.1	-10.4	643.1	1137.4
30,000 - 39,999 lbs	14	-161.9	-11.6	1871.8	2467.0
TOTALS	92	-757.1	-8.2	6467.8	22012.7

K = No. of classes = 4

Estimate of population variance based entirely on scatter between the group means:

$S_b^2 = 78.9$

Estimate of population variance based entirely on scatter among scores within the groups:

$S_w^2 = 176.6$

$$\frac{S_b^2}{S_w^2} = \frac{78.9}{176.6} = 0.45$$

F value at 5% significance level = 2.70. Therefore at the 5% level reject the null hypothesis and conclude that there is no significant difference between the sample means.

TABLE B.D.3.3 - WEIGHT RANGE ANALYSIS FOR TRUCKS

Weight Range	Sample Size	Percentage Difference (%)		Absolute Difference (x 1000 lbs)	
		Mean	S.D.	Mean	S.D.
Less than 10,000 lbs	3	-4.5	7.9	-0.6	1.1
10,000 - 19,999 lbs	3	1.5	11.3	0.2	2.3
20,000 - 29,999 lbs	10	-7.8	10.8	-2.5	3.6
30,000 - 39,999 lbs	2	-18.9	20.7	-8.6	9.3
40,000 - 49,999 lbs	2	-9.1	10.2	-5.1	5.8
50,000 - 59,999 lbs	4	-9.2	8.1	-6.0	5.1
60,000 - 69,999 lbs	5	-13.4	5.1	-10.5	3.9
More than 70,000 lbs	2	-1.5	10.6	-1.2	8.6
TOTAL	31	-8.0	10.3	-4.3	5.4

TABLE B.D.3.4 - F-TEST DATA FOR TRUCK WEIGHTS

Weight Range	Sample Size	Percentage Difference (%)		$\frac{\sum (PD)^2}{N}$	$\sum (PD^2)$
		Sum	Mean		
Less than 10,000 lbs	3	-13.4	-4.5	60.3	184.5
10,000 - 19,999 lbs	3	4.6	1.5	7.1	263.6
20,000 - 29,999 lbs	10	-77.7	-7.8	603.7	1655.1
30,000 - 39,999 lbs	2	-37.7	-18.9	711.8	1140.7
40,000 - 49,999 lbs	2	-18.2	-9.1	166.1	269.7
50,000 - 59,999 lbs	4	-36.8	-9.2	337.7	533.9
60,000 - 69,999 lbs	5	-67.0	-13.4	897.4	1002.3
More than 70,000 lbs	2	-2.9	-1.5	4.2	117.1
TOTAL	31	-40.2	-2.5	174.6	566.9

K = No. of classes = 8

Estimate of population variance based entirely on scatter between the group means:

$$S_b^2 = 112.3$$

Estimate of population variance based entirely on scatter among scores within the groups:

$$S_w^2 = 103.4$$

$$\frac{S_b^2}{S_w^2} = \frac{112.3}{103.4} = 1.09$$

F value at 5% significance level = 2.44. Therefore at the 5% level reject the null hypothesis and conclude that there is no significant difference between the sample means.

TABLE B.D.3.5 - COMPARISON OF INDIVIDUAL AXLE WEIGHT RANGES

Weight Ranges (lbs)	V1	V2	S1	S2	F	F (5%)	F (1%)	
30,000-39,999 / 0-9,999	46	24	16.1	15.8	1.0	1.9	2.5	
0-9,999 / 20,000-29,999	24	5	15.8	13.8	1.3	4.5	9.5	
0-9,999 / 30,000-39,999	24	13	15.8	13.3	1.4	2.4	3.6	
10,000-19,999 / 20,000-29,999	46	5	16.1	13.8	1.4	4.4	9.3	
10,000-19,999 / 30,000-39,999	46	13	16.1	13.3	1.5	2.3	3.4	
20,000-29,999 / 30,000-39,999	5	13	13.8	13.3	1.1	3.0	4.9	

TABLE B.D.3.6 - COMPARISON OF INDIVIDUAL TRUCK WEIGHT RANGES

Weight Ranges (lbs)	V1	V2	S1	S2	F	F (5%)	F (1%)	
20,000-29,999 / 10,000-19,999	2	2	9.4	7.8	1.4	19.0	99.0	
30,000-39,999 / 10,000-19,999	9	2	12.9	7.8	2.7	19.4	99.4	
40,000-49,999 / 10,000-19,999	1	2	23.9	7.8	9.3	18.5	98.5	
50,000-59,999 / 10,000-19,999	1	2	11.6	7.8	2.2	18.5	98.5	
60,000-69,999 / 10,000-19,999	3	2	11.6	7.8	2.2	19.2	99.2	
70,000-79,999 / 10,000-19,999	4	2	14.2	7.8	3.3	19.2	99.2	
10,000-19,999 / 80,000-	2	1	7.8	7.7	1.1	200.0	5000.0	
30,000-39,999 / 20,000-29,999	9	2	12.9	9.4	1.9	19.4	99.4	
40,000-49,999 / 20,000-29,999	1	2	23.9	9.4	6.5	18.5	98.5	
50,000-59,999 / 20,000-29,999	1	2	11.6	9.4	1.5	18.5	98.5	
60,000-69,999 / 20,000-29,999	3	2	11.6	9.4	1.5	19.2	99.2	
70,000-79,999 / 20,000-29,999	4	2	14.2	9.4	2.3	19.2	99.2	
20,000-29,999 / 80,000-	2	1	9.4	7.7	1.5	200.0	5000.0	
40,000-49,999 / 30,000-39,999	1	9	23.9	12.9	3.4	5.1	10.6	
30,000-39,999 / 50,000-59,999	9	1	12.9	11.6	1.2	241.0	6023.0	
30,000-39,999 / 60,000-69,999	9	3	12.9	11.6	1.2	8.8	27.3	
70,000-79,999 / 30,000-39,999	4	9	14.2	12.9	1.2	3.6	6.4	
30,000-39,999 / 80,000-	9	1	12.9	7.7	2.8	241.0	6023.0	
40,000-49,999 / 50,000-59,999	1	1	23.9	11.6	4.2	161.0	4052.0	
40,000-39,999 / 60,000-69,999	1	3	23.9	11.6	4.3	10.1	34.1	
40,000-39,999 / 70,000-79,999	1	4	23.9	14.2	2.8	7.7	21.2	
40,000-39,999 / 80,000-	1	1	23.9	7.7	9.7	161.0	4052.0	
50,000-59,999 / 60,000-69,999	1	3	11.6	11.6	1.0	10.1	34.1	
70,000-79,999 / 50,000-59,999	4	1	14.2	11.6	1.5	225.0	5625.0	
50,000-59,999 / 80,000-	1	1	11.6	7.7	2.3	161.0	4052.0	
70,000-79,999 / 60,000-69,999	4	3	14.2	11.6	1.5	9.1	28.7	
60,000-69,999 / 80,000-	3	1	11.6	7.7	2.3	216.0	5403.0	
70,000-79,999 / 80,000-	4	1	14.2	7.7	3.4	225.0	5625.0	

KELSO, WA - JULY 29, 1993

TABLE B.F.3.1 - WEIGHT RANGE ANALYSIS FOR AXLES

Weight Range	Sample Size	Percentage Difference (%)		Absolute Difference (x 1000 lbs)	
		Mean	S.D.	Mean	S.D.
Less than 10,000 lbs	49	-17.7	14.4	-1.5	1.2
10,000 - 19,999 lbs	107	-15.7	13.9	-1.9	1.8
20,000 - 29,999 lbs	21	-15.0	17.2	-3.8	4.0
30,000 - 39,999 lbs	52	-16.3	15.7	-6.0	9.2
TOTAL	229	-16.2	14.7	-2.9	5.0

Mean absolute difference below 10,000 lbs is -1,500 lbs with a standard deviation of 1,200 lbs.

Mean percentage difference above 10,000 lbs is -15.8% with a standard deviation of 14.7%.

TABLE B.F.3.2 - F-TEST DATA FOR AXLE WEIGHTS

Weight Range	Sample Size	Percentage Difference (%)		$\frac{\sum (PD)^2}{N}$	$\sum (PD^2)$
		Sum	Mean		
Less than 10,000 lbs	49	-866.6	-17.7	15325.9	25315.6
10,000 - 19,999 lbs	107	-1685.1	-15.7	26538.4	46927.0
20,000 - 29,999 lbs	21	-315.3	-15.0	4734.3	10630.4
30,000 - 39,999 lbs	52	-845.1	-16.3	13733.6	26265.6
TOTALS	229	-3712.1	-16.2	60332.2	109138.6

K = No. of classes = 4

Estimate of population variance based entirely on scatter between the group means:

$S_b^2 = 53.2$

Estimate of population variance based entirely on scatter among scores within the groups:

$S_w^2 = 216.9$

$$\frac{S_b^2}{S_w^2} = \frac{53.2}{216.9} = 0.25$$

F value at 5% significance level = 2.60. Therefore at the 5% level reject the null hypothesis and conclude that there is significant difference between the sample means.

TABLE B.F.3.3 - WEIGHT RANGE ANALYSIS FOR TRUCKS

Weight Range	Sample Size	Percentage Difference (%)		Absolute Difference (x 1000 lbs)	
		Mean	S.D.	Mean	S.D.
0 - 29,999 lbs	10	-18.9	10.2	-4.7	2.9
30,000 - 39,999 lbs	16	-18.6	3.6	-6.2	1.1
40,000 - 49,999 lbs	7	-7.8	22.6	-3.6	10.0
50,000 - 59,999 lbs	5	-15.2	3.2	-8.3	2.0
60,000 - 69,999 lbs	5	-21.4	16.7	-14.1	10.6
70,000 - 79,999 lbs	18	-13.1	8.6	-9.9	6.5
More than 80,000 lbs	10	-13.7	13.0	-16.5	23.1
TOTAL	71	-15.4	11.4	-8.8	10.6

TABLE B.F.3.4 - F-TEST DATA FOR TRUCK WEIGHTS

Weight Range	Sample Size	Percentage Difference (%)		$\frac{\sum (PD)^2}{N}$	$\sum (PD^2)$
		Sum	Mean		
0 - 29,999 lbs	10	-188.9	-18.9	355.6	4487.0
30,000 - 39,999 lbs	16	-297.0	-18.6	5513.7	5704.6
40,000 - 49,999 lbs	7	-54.9	-7.8	431.2	3491.8
50,000 - 59,999 lbs	5	-75.9	-15.2	1151.4	1191.6
60,000 - 69,999 lbs	5	-107.1	-21.4	2295.2	3410.5
70,000 - 79,999 lbs	18	-235.0	-13.1	3067.4	4330.5
More than 80,000 lbs	10	-137.1	-13.7	1880.6	3407.7
TOTAL	71	-1095.6	-15.4	17895.1	26023.8

K = No. of classes = 7

Estimate of population variance based entirely on scatter between the group means:

$S_b^2 = 164.7$

Estimate of population variance based entirely on scatter among scores within the groups:

$S_w^2 = 127.0$

$$\frac{S_b^2}{S_w^2} = \frac{164.7}{127.0} = 1.30$$

F value at 5% significance level = 2.25. Therefore at the 5% level reject the null hypothesis and conclude that there is no significant difference between the sample means.

TABLE B.F.3.5 - COMPARISON OF INDIVIDUAL AXLE WEIGHT RANGES

Weight Ranges (lbs)	V1	V2	S1	S2	F	F (5%)	F (1%)	
0-9,999 / 10,000-19,999	48	106	22.7	20.9	1.2	1.5	1.8	
0-9,999 / 20,000-29,999	48	20	22.7	22.5	1.0	2.0	2.7	
30,000-39,99 / 0-9,999	51	48	22.5	22.7	1.0	1.6	2.0	
20,000-29,999 / 10,000-19,999	20	106	22.5	20.9	1.2	1.7	2.1	
30,000-39,999 / 10,000-19,999	51	106	22.5	20.9	1.2	1.5	2.0	
30,000-39,999 / 20,000-29,999	51	20	22.5	22.5	1.0	2.0	2.7	

TABLE B.F.3.6 - COMPARISON OF INDIVIDUAL TRUCK WEIGHT RANGES

Weight Ranges (lbs)	V1	V2	S1	S2	F	F (5%)	F (1%)	
0-29,999 / 30,000-39,999	9	15	22.2	18.9	1.3	2.6	3.9	
40,000-49,999 / 0-29,999	6	9	22.3	21.2	1.1	3.4	5.8	
0-29,999 / 50,000-59,999	9	4	21.2	15.4	1.9	6.0	14.7	
60,000-69,999 /0-29,999	4	9	26.1	21.2	1.5	3.6	6.4	
0-29,999 / 70,000-79,999	9	17	21.2	15.5	1.9	2.5	3.7	
0-29,999 / 80,000-	9	9	21.2	18.5	1.3	3.2	5.4	
40,000-49,999 / 30,000-39,999	6	15	22.3	18.9	1.4	2.8	4.3	
30,000-39,999 / 50,000-59,999	15	4	18.9	15.4	1.5	5.9	14.2	
60,000-69,999 / 30,000-39,999	4	15	26.1	18.9	1.9	3.1	4.9	
30,000-39,999 / 70,000-79,999	15	17	18.9	15.5	1.5	2.3	3.3	
30,000-39,999 / 80,000-	15	9	18.9	18.5	1.0	3.0	5.0	
40,000-49,999 / 50,000-59,999	6	4	22.3	15.4	2.1	6.2	15.2	
60,000-69,999 / 40,000-49,999	4	6	26.1	22.3	1.4	4.5	9.2	
40,000-39,999 / 70,000-79,999	6	17	22.3	15.5	2.1	2.7	4.1	
40,000-39,999 / 80,000-	6	9	22.3	18.5	1.5	3.4	5.8	
60,000-69,999 / 50,000-59,999	4	4	26.1	15.4	2.9	6.4	16.0	
70,000-79,999 / 50,000-59,999	17	4	15.5	15.4	1.0	5.8	14.0	
80,000- / 50,000-59,999	9	4	18.5	15.4	1.4	6.0	14.7	
60,000-69,999 / 70,000-79,999	4	17	26.1	15.5	2.8	3.0	4.7	
60,000-69,999 / 80,000-	4	9	26.1	18.5	2.0	3.6	6.4	
80,000- / 70,000-79,999	9	17	18.5	15.5	1.4	2.5	3.7	

WOODBURN, OR - MARCH 8, 1993

TABLE B.J.3.1 - WEIGHT RANGE ANALYSIS FOR AXLES

Weight Range	Sample Size	Percentage Difference (%)		Absolute Difference (x 1000 lbs)	
		Mean	S.D.	Mean	S.D.
Less than 10,000 lbs	42	6.9	30.9	0.5	1.7
10,000 - 19,999 lbs	248	4.3	13.7	0.6	1.9
20,000 - 29,999 lbs	96	-0.8	5.5	-0.2	1.3
30,000 - 39,999 lbs	196	-0.9	4.8	-0.3	1.6
TOTAL	582	1.9	13.0	0.1	1.7

Mean absolute difference below 10,000 lbs is 500 lbs with a standard deviation of 1,700 lbs.

Mean percentage difference above 10,000 lbs is 1.5% with a standard deviation of 10.3%.

TABLE B.J.3.2 - F-TEST DATA FOR AXLE WEIGHTS

Weight Range	Sample Size	Percentage Difference (%)		$\frac{\sum (PD)^2}{N}$	$\sum (PD^2)$
		Sum	Mean		
Less than 10,000 lbs	42	288.8	6.9	1985.5	41187.0
10,000 - 19,999 lbs	248	1077.6	4.3	4682.6	51183.4
20,000 - 29,999 lbs	96	-73.3	-0.8	55.9	2890.2
30,000 - 39,999 lbs	196	-169.1	-0.9	145.9	4680.1
TOTALS	582	1124.0	1.9	6869.9	99940.6

K = No. of classes = 4

Estimate of population variance based entirely on scatter between the group means:

$S_b^2 = 1566.3$

Estimate of population variance based entirely on scatter among scores within the groups:

$S_w^2 = 161.0$

$$\frac{S_b^2}{S_w^2} = \frac{1566.3}{161.0} = 9.73$$

F value at 5% significance level = 2.60. Therefore at the 5% level reject the null hypothesis and conclude that there is a significant difference between the sample means.

TABLE B.J.3.3 - WEIGHT RANGE ANALYSIS FOR TRUCKS

Weight Range	Sample Size	Percentage Difference (%)		Absolute Difference (x 1000 lbs)	
		Mean	S.D.	Mean	S.D.
Less than 30,000 lbs	5	6.9	8.3	1.8	1.6
30,000 - 39,999 lbs	12	-0.9	3.0	-0.3	1.0
40,000 - 49,999 lbs	5	-1.2	5.5	-0.4	2.5
50,000 - 59,999 lbs	20	-0.8	1.9	-0.4	1.1
60,000 - 69,999 lbs	9	-1.7	3.2	-1.1	2.2
70,000 - 79,999 lbs	85	-0.1	2.2	-0.0	1.6
More than 80,000 lbs	36	2.3	3.7	2.3	3.7
TOTAL	172	0.4	3.4	0.4	2.4

TABLE B.J.3.4 - F-TEST DATA FOR TRUCK WEIGHTS

Weight Range	Sample Size	Percentage Difference (%)		$\frac{\sum (PD)^2}{N}$	$\sum (PD^2)$
		Sum	Mean		
Less than 30,000 lbs	5	34.3	6.9	235.0	511.5
30,000 - 39,999 lbs	12	-10.8	-0.9	9.7	107.9
40,000 - 49,999 lbs	5	-5.8	-1.2	6.7	126.1
50,000 - 59,999 lbs	20	-15.6	-0.8	12.2	77.3
60,000 - 69,999 lbs	9	-15.6	-1.7	27.2	107.6
70,000 - 79,999 lbs	85	-4.9	-0.1	0.3	389.2
More than 80,000 lbs	36	82.7	2.3	189.9	8.6
TOTAL	172	64.2	0.4	481.0	1328.3

K = No. of classes = 7

Estimate of population variance based entirely on scatter between the group means:

$S_b^2 = 76.2$

Estimate of population variance based entirely on scatter among scores within the groups:

$S_w^2 = 5.1$

$$\frac{S_b^2}{S_w^2} = \frac{76.2}{5.1} = 14.83$$

F value at 5% significance level = 2.16. Therefore at the 5% level reject the null hypothesis and conclude that there is a significant difference between the sample means.

TABLE B.J.3.5 - COMPARISON OF INDIVIDUAL AXLE WEIGHT RANGES

Weight Ranges (lbs)	V1	V2	S1	S2	F	F (5%)	F (1%)	
0-9,999 / 10,000-19,999	41	247	31.3	14.4	4.8	1.4	1.6	++
0-9,999 / 20,000-29,999	41	95	31.3	5.5	32.6	1.6	1.9	++
0-9,999 / 30,000-39,999	41	195	31.3	4.9	40.8	1.4	1.6	++
10,000-19,999 / 20,000-29,999	247	95	14.4	5.5	6.9	1.3	1.4	++
10,000-19,999 / 30,000-39,999	247	195	14.4	4.9	8.6	1.0	1.0	++
20,000-29,999 / 30,000-39,999	95	195	5.5	4.9	1.3	1.3	1.4	+

TABLE B.J.3.6 - COMPARISON OF INDIVIDUAL TRUCK WEIGHT RANGES

Weight Ranges (lbs)	V1	V2	S1	S2	F	F (5%)	F (1%)	
0-29,999 / 30,000-39,999	4	11	10.1	3.0	11.3	3.4	5.7	++
0-29,999 / 40,000-49,999	4	4	10.1	5.0	4.1	6.4	16.0	+
0-29,999 / 50,000-59,999	4	19	10.1	2.0	25.5	2.9	4.5	++
0-29,999 / 60,000-69,999	4	8	10.1	3.5	8.3	3.8	7.0	++
0-29,999 / 70,000-79,999	4	84	10.1	2.1	23.1	2.5	3.6	++
0-29,999 / 80,000-	4	35	10.1	0.5	408.0	2.6	3.9	++
40,000-49,999 / 30,000-39,999	4	11	5.0	3.0	2.8	3.4	5.7	
30,000-39,999 / 50,000-59,999	11	19	3.0	2.0	2.3	2.4	3.4	
60,000-69,999 / 30,000-39,999	8	11	3.5	3.0	1.4	3.0	4.7	
30,000-39,999 / 70,000-79,999	11	84	3.0	2.1	2.0	1.9	2.5	+
30,000-39,999 / 80,000-	11	35	3.0	0.5	36.0	2.1	2.8	++
40,000-49,999 / 50,000-59,999	4	19	5.0	2.0	6.3	2.9	4.5	++
40,000-39,999 / 60,000-69,999	4	8	5.0	3.5	2.0	3.8	7.0	
40,000-39,999 / 70,000-79,999	4	84	5.0	2.1	5.7	2.5	3.5	++
40,000-39,999 / 80,000-	4	35	5.0	0.5	100.0	2.7	3.9	++
60,000-69,999 / 50,000-59,999	8	19	3.5	2.0	3.1	2.5	3.6	+
70,000-79,999 / 50,000-59,999	84	19	2.1	2.0	1.1	2.0	2.6	
50,000-59,999 / 80,000-	19	35	2.0	0.5	16.0	2.0	2.5	++
60,000-69,999 / 70,000-79,999	8	84	3.5	2.1	2.8	2.1	2.7	++
60,000-69,999 / 80,000-	8	35	3.5	0.5	49.0	2.2	3.1	++
70,000-79,999 / 80,000-	84	35	2.1	0.5	17.6	1.7	2.1	++

BOW HILL, WA - APRIL 13, 1993

TABLE B.M.3.1 - WEIGHT RANGE ANALYSIS FOR AXLES

Weight Range	Sample Size	Percentage Difference (%)		Absolute Difference (x 1000 lbs)	
		Mean	S.D.	Mean	S.D.
Less than 10,000 lbs	74	4.0	12.4	0.2	0.9
10,000 - 19,999 lbs	73	1.8	12.6	0.2	1.7
20,000 - 29,999 lbs	19	0.4	7.3	0.0	1.9
30,000 - 39,999 lbs	15	-6.6	15.5	2.1	5.1
TOTAL	181	1.9	12.6	0.0	2.1

Mean absolute difference below 10,000 lbs is 200 lbs with a standard deviation of 900 lbs.

Mean percentage difference above 10,000 lbs is 0.4% with a standard deviation of 12.5%.

TABLE B.M.3.2 - F-TEST DATA FOR AXLE WEIGHTS

Weight Range	Sample Size	Percentage Difference (%)		$\frac{\sum (PD)^2}{N}$	$\sum (PD^2)$
		Sum	Mean		
Less than 10,000 lbs	74	293.7	4.0	1165.6	12425.8
10,000 - 19,999 lbs	73	134.3	1.8	247.1	11600.4
20,000 - 29,999 lbs	19	7.2	0.4	2.7	974.8
30,000 - 39,999 lbs	15	-98.6	-6.6	647.9	4011.1
TOTALS	181	336.6	1.9	2063.3	29012.2

K = No. of classes = 4

Estimate of population variance based entirely on scatter between the group means:

$S_b^2 = 479.1$

Estimate of population variance based entirely on scatter among scores within the groups:

$S_w^2 = 152.3$

$$\frac{S_b^2}{S_w^2} = \frac{479.1}{152.3} = 3.15$$

F value at 5% significance level = 2.60. Therefore at the 5% level reject the null hypothesis and conclude that there is a significant difference between the sample means.

TABLE B.M.3.3 - WEIGHT RANGE ANALYSIS FOR TRUCKS

Weight Range	Sample Size	Percentage Difference (%)		Absolute Difference (x 1000 lbs)	
		Mean	S.D.	Mean	S.D.
Less than 10,000 lbs	6	1.3	4.4	0.1	0.4
10,000 - 19,999 lbs	5	2.1	6.7	0.4	1.1
20,000 - 29,999 lbs	14	0.1	22.2	0.2	5.1
30,000 - 39,999 lbs	13	4.2	4.3	1.5	1.5
40,000 - 49,999 lbs	4	-1.7	8.4	-0.6	3.6
50,000 - 59,999 lbs	3	4.4	2.0	2.5	1.3
60,000 - 69,999 lbs	4	0.6	3.5	0.4	2.2
70,000 - 79,999 lbs	7	-6.6	12.0	-5.1	9.4
More than 80,000 lbs	4	1.5	4.1	1.3	3.7
TOTAL	60	0.7	12.1	0.0	4.6

TABLE B.M.3.4 - F-TEST DATA FOR TRUCK WEIGHTS

Weight Range	Sample Size	Percentage Difference (%)		$\frac{\sum (PD)^2}{N}$	$\sum (PD^2)$
		Sum	Mean		
Less than 10,000 lbs	6	8.0	1.3	10.7	106.2
10,000 - 19,999 lbs	5	10.7	2.1	22.9	202.6
20,000 - 29,999 lbs	14	1.4	0.1	0.1	6382.5
30,000 - 39,999 lbs	13	54.6	4.2	229.7	452.3
40,000 - 49,999 lbs	4	-7.0	-1.7	12.2	222.0
50,000 - 59,999 lbs	3	13.3	4.4	58.8	67.0
60,000 - 69,999 lbs	4	2.3	0.6	1.4	37.7
70,000 - 79,999 lbs	7	-46.3	-6.6	306.0	1177.1
More than 80,000 lbs	4	5.9	1.5	8.8	59.5
TOTAL	60	43.0	0.7	650.6	8707.2

K = No. of classes = 9

Estimate of population variance based entirely on scatter between the group means:

$S_b^2 = 77.5$

Estimate of population variance based entirely on scatter among scores within the groups:

$S_w^2 = 158.0$

$$\frac{S_b^2}{S_w^2} = \frac{77.5}{158.0} = 0.49$$

F value at 5% significance level = 2.14. Therefore at the 5% level reject the null hypothesis and conclude that there is no significant difference between the sample means.

TABLE B.M.3.5 -COMPARISON OF INDIVIDUAL AXLE WEIGHT RANGES

Weight Ranges (lbs)	V1	V2	S1	S2	F	F (5%)	F (1%)	
0-9,999 / 10,000-19,999	73	72	13.0	12.6	1.1	5.2	11.4	
0-9,999 / 20,000-29,999	73	18	13.0	7.2	3.3	4.7	9.8	
30,000-39,999 / 0-9,999	14	73	16.4	13.0	1.6	1.9	2.3	
10,000-19,999 / 20,000-29,999	72	18	12.6	7.2	3.1	1.8	2.2	++
30,000-39,999 / 10,000-19,999	14	72	16.4	12.6	1.7	1.9	2.4	
20,000-29,999 / 30,000-39,999	14	18	16.4	7.2	5.2	2.3	3.3	++

TABLE B.M.3.6 - COMPARISON OF INDIVIDUAL TRUCK WEIGHT RANGES

Weight Ranges (lbs)	V1	V2	S1	S2	F	F (5%)	F (1%)	
10,000-19,999 / 0-9,999	4	5	6.4	4.2	2.3	5.2	11.4	
20,000-29,999 / 0-9,999	13	5	21.4	4.2	25.7	4.7	9.8	++
30,000-39,999 / 0-9,999	12	5	5.9	4.2	2.0	4.7	9.9	
40,000-49,999 / 0-9,999	3	5	7.5	4.2	3.1	5.4	12.1	
50,000-59,999 / 0-9,999	2	5	4.7	4.2	1.3	5.8	13.3	
0-9,999 / 60,000-69,999	5	3	4.2	3.1	1.9	9.0	28.2	
70,000-79,999 / 0-9,999	6	5	13.0	4.2	9.5	5.0	10.7	+
0-9,999 / 80,000-	5	3	4.2	3.9	1.2	9.0	28.2	
20,000-29,999 / 10,000-19,999	13	4	21.4	6.4	11.2	5.9	14.3	+
10,000-19,999 / 30,000-39,999	4	12	6.4	5.9	1.2	3.3	5.4	
40,000-49,999 / 10,000-19,999	3	4	7.5	6.4	1.4	6.6	16.7	
10,000-19,999 / 10,000-19,999	4	2	6.4	4.7	1.8	19.2	99.2	
10,000-19,999 / 50,000-59,999	4	3	6.4	3.1	4.3	9.1	28.7	
70,000-79,999 / 10,000-19,999	6	4	13.0	6.4	4.1	6.2	15.2	
10,000-19,999 / 80,000-	4	3	6.4	3.9	2.7	9.1	28.7	
20,000-29,999 / 30,000-39,999	13	12	21.4	5.9	3.1	2.7	4.1	
20,000-29,999 / 40,000-49,999	13	3	21.4	7.5	8.2	8.7	27.0	
20,000-29,999 / 50,000-59,999	13	2	21.4	4.7	20.4	19.4	99.4	+
20,000-29,999 / 60,000-69,999	13	3	21.4	3.1	48.4	8.7	27.0	++
20,000-29,999 / 70,000-79,999	13	6	21.4	13.0	2.7	4.0	7.7	
20,000-29,999 / 80,000-	13	3	21.4	3.9	30.6	8.7	27.0	++
40,000-49,999 / 30,000-39,999	3	12	7.5	5.9	1.6	3.5	6.0	
30,000-39,999 / 50,000-59,999	12	2	5.9	4.7	1.6	19.4	99.4	
30,000-39,999 / 60,000-69,999	12	3	5.9	3.1	3.7	8.7	27.1	
30,000-39,999 / 70,000-79,999	6	12	13.0	5.9	4.8	3.0	4.8	++
30,000-39,999 / 80,000-	12	3	5.9	3.9	2.3	8.7	27.1	
40,000-49,999 / 50,000-59,999	3	2	7.5	4.7	2.5	19.2	99.2	
40,000-49,999 / 60,000-69,999	3	3	7.5	3.1	5.9	9.3	29.5	
70,000-79,999 / 40,000-49,999	6	3	13.0	7.5	3.0	8.9	27.9	
40,000-49,999 / 80,000-	3	3	7.5	3.9	3.7	9.3	29.5	
50,000-59,999 / 60,000-69,999	2	3	4.7	3.1	2.4	9.6	30.8	
70,000-79,999 / 50,000-59,999	6	2	13.0	4.7	7.5	19.3	99.3	
50,000-59,999 / 80,000-	2	3	4.7	3.9	1.5	9.6	30.8	
70,000-79,999 / 60,000-69,999	6	3	13.0	3.1	7.8	8.9	27.9	
80,000- / 60,000-69,999	3	3	3.9	3.1	1.6	9.3	39.5	
70,000-79,999 / 80,000-	6	3	13.0	3.9	11.3	8.9	27.9	++

BOW HILL, WA - JUNE 25, 1993

TABLE B.M.3.7 - WEIGHT RANGE ANALYSIS FOR AXLES

Weight Range	Sample Size	Percentage Difference (%)		Absolute Difference (x 1000 lbs)	
		Mean	S.D.	Mean	S.D.
Less than 10,000 lbs	136	-0.2	23.4	-0.1	1.3
10,000 - 19,999 lbs	178	-3.9	12.4	-0.5	1.7
20,000 - 29,999 lbs	34	-0.9	8.0	-0.3	1.9
30,000 - 39,999 lbs	52	-0.4	9.1	-0.1	3.1
TOTAL	400	-1.9	16.5	-0.3	1.8

Mean absolute difference below 10,000 lbs is -100 lbs with a standard deviation of 1,300 lbs.

Mean percentage difference above 10,000 lbs is -2.8% with a standard deviation of 11.4%.

TABLE B.M.3.8 - F-TEST DATA FOR AXLE WEIGHTS

Weight Range	Sample Size	Percentage Difference (%)		$\frac{\sum (PD)^2}{N}$	$\sum (PD^2)$
		Sum	Mean		
Less than 10,000 lbs	136	-20.7	-0.2	3.1	73665.8
10,000 - 19,999 lbs	178	-700.5	-3.9	2756.6	30147.3
20,000 - 29,999 lbs	34	-29.4	-0.9	25.4	2144.5
30,000 - 39,999 lbs	52	-19.3	-0.4	7.2	4229.1
TOTALS	400	-769.8	-1.9	2792.3	110186.7

K = No. of classes = 4

Estimate of population variance based entirely on scatter between the group means: $S_b^2 = 436.9$

Estimate of population variance based entirely on scatter among scores within the groups:

$S_w^2 = 271.2$

$$\frac{S_b^2}{S_w^2} = \frac{436.9}{271.2} = 1.61$$

F value at 5% significance level = 2.60. Therefore at the 5% level reject the null hypothesis and conclude that there is no significant difference between the sample means.

TABLE B.M.3.9 - WEIGHT RANGE ANALYSIS FOR TRUCKS

Weight Range	Sample Size	Percentage Difference (%)		Absolute Difference (x 1000 lbs)	
		Mean	S.D.	Mean	S.D.
Less than 20,000 lbs	10	11.0	47.2	1.1	5.3
20,000 - 29,999 lbs	11	0.7	8.6	0.1	2.3
30,000 - 39,999 lbs	58	-4.0	9.0	-1.4	3.0
40,000 - 49,999 lbs	8	-5.3	3.0	-2.3	1.2
50,000 - 59,999 lbs	2	6.7	2.2	3.8	1.1
60,000 - 69,999 lbs	11	-0.9	3.9	-0.5	2.6
70,000 - 79,999 lbs	20	0.7	7.3	0.5	5.6
More than 80,000 lbs	8	-3.9	6.4	-3.7	5.6
TOTAL	128	-1.3	15.2	-0.8	3.9

TABLE B.M.3.10 - F-TEST DATA FOR AXLE WEIGHTS

Weight Range	Sample Size	Percentage Difference (%)		$\frac{\sum (PD)^2}{N}$	$\sum (PD^2)$
		Sum	Mean		
Less than 20,000 lbs	10	110.2	11.0	1215.4	21231.3
20,000 - 29,999 lbs	11	7.9	0.7	5.7	741.7
30,000 - 39,999 lbs	58	-233.0	-4.0	935.7	5520.7
40,000 - 49,999 lbs	8	-42.2	-5.3	222.1	286.7
50,000 - 59,999 lbs	2	13.4	6.7	89.3	94.3
60,000 - 69,999 lbs	11	-9.4	-0.9	8.0	162.1
70,000 - 79,999 lbs	20	14.8	0.7	11.0	1014.0
More than 80,000 lbs	8	-31.5	-3.9	124.4	415.3
TOTAL	128	-169.7	-1.3	2611.7	29466.1

K = No. of classes = 8

Estimate of population variance based entirely on scatter between the group means:

$S_b^2 = 341.0$

Estimate of population variance based entirely on scatter among scores within the groups:

$S_w^2 = 223.8$

$$\frac{S_b^2}{S_w^2} = \frac{341.0}{223.8} = 1.52$$

F value at 5% significance level = 2.09. Therefore at the 5% level reject the null hypothesis and conclude that there is no significant difference between the sample means.

TABLE B.M.3.11 - COMPARISON OF INDIVIDUAL AXLE WEIGHT RANGES

Weight Ranges (lbs)	V1	V2	S1	S2	F	F (5%)	F (1%)	
0-9,999 / 10,000-19,999	135	177	23.3	13.0	3.2	1.0	1.0	++
0-9,999 / 20,000-29,999	135	33	23.3	7.9	8.6	1.6	2.0	++
30,000-39,999 / 0-9,999	135	51	23.3	9.0	6.7	1.5	1.7	++
10,000-19,999 / 20,000-29,999	177	33	13.0	7.9	2.7	1.6	2.0	++
10,000-19,999 / 30,000-39,999	177	51	13.0	9.0	2.1	1.5	1.7	++
20,000-29,999 / 30,000-39,999	51	33	9.0	7.9	1.3	1.7	2.2	

TABLE B.M.3.12 - COMPARISON OF INDIVIDUAL TRUCK WEIGHT RANGES

Weight Ranges (lbs)	V1	V2	S1	S2	F	F (5%)	F (1%)	
0-19,999 / 20,000-29,999	9	10	46.1	8.2	31.5	3.0	4.9	++
0-19,999 / 30,000-39,999	9	57	46.1	9.8	22.3	2.1	2.8	++
0-19,999 / 40,000-49,999	9	7	46.1	6.0	59.2	3.7	6.7	++
0-19,999 / 50,000-59,999	9	1	46.1	6.9	45.0	241.0	6023	
0-19,999 / 60,000-69,999	9	10	46.1	3.8	144.0	3.0	4.9	++
0-19,999 / 70,000-79,999	9	19	46.1	7.1	41.9	2.4	3.5	++
0-19,999 / 80,000-	9	7	46.1	7.2	40.8	3.7	6.7	++
20,000-29,999 / 30,000-39,999	57	10	9.8	8.2	1.4	2.6	4.1	
20,000-29,999 / 40,000-49,999	10	7	8.2	6.0	1.9	3.6	6.6	
20,000-29,999 / 50,000-59,999	10	1	8.2	6.9	1.4	242.0	6056	
20,000-29,999 / 60,000-69,999	10	10	8.2	3.8	4.6	3.0	4.9	+
20,000-29,999 / 70,000-79,999	10	19	8.2	7.1	1.3	2.4	3.4	
20,000-29,999 / 80,000-	10	7	8.2	7.2	1.3	3.6	6.6	
30,000-39,999 / 40,000-49,999	57	7	9.8	6.0	2.7	3.3	5.9	
30,000-39,999 / 50,000-59,999	57	1	9.8	6.9	2.0	252.0	6300	
30,000-39,999 / 60,000-69,999	57	10	9.8	3.8	6.5	2.6	4.1	++
30,000-39,999 / 70,000-79,999	57	19	9.8	7.1	1.9	2.0	2.7	
30,000-39,999 / 80,000-	57	7	9.8	7.2	1.8	3.3	5.9	
50,000-59,999 / 40,000-49,999	1	7	6.9	6.0	1.3	5.6	12.2	
40,000-49,999 / 60,000-69,999	7	10	6.0	3.8	2.4	3.1	5.2	
70,000-79,999 / 40,000-49,999	19	7	7.1	6.0	1.4	3.5	6.2	
80,000- / 40,000-49,999	7	7	7.2	6.0	1.4	3.8	7.0	
50,000-59,999 / 60,000-69,999	1	10	6.9	3.8	3.2	5.0	10.0	
70,000-79,999 / 50,000-59,999	19	1	7.1	6.9	1.1	248.0	6190	
80,000- / 50,000-59,999	7	1	7.2	6.9	1.1	237.0	5928	
70,000-79,999 / 60,000-69,999	19	10	7.1	3.8	3.4	2.8	4.5	+
80,000- / 60,000-69,999	7	10	7.2	3.8	3.5	3.1	5.2	+
80,000- / 80,000-79,999	7	19	7.2	7.1	1.0	2.5	3.8	

SANTA NELLA, CA - MAY 7, 1993 - HIGH SPEED WIM

TABLE B.O.3.1 - WEIGHT RANGE ANALYSIS FOR AXLES

Weight Range	Sample Size	Percentage Difference (%)		Absolute Difference (x 1000 lbs)	
		Mean	S.D.	Mean	S.D.
Less than 10,000 lbs	11	3.1	7.2	0.1	0.5
10,000 - 19,999 lbs	27	0.9	10.9	0.1	1.6
20,000 - 29,999 lbs	7	2.3	2.7	0.6	0.7
30,000 - 39,999 lbs	7	2.4	4.6	0.8	1.5
TOTAL	52	1.7	8.7	0.3	1.3

Mean absolute difference below 10,000 lbs is 100 lbs with a standard deviation of 500 lbs.

Mean percentage difference above 10,000 lbs is 1.4% with a standard deviation of 9.0%.

TABLE B.O.3.2 - F-TEST DATA FOR AXLE WEIGHTS

Weight Range	Sample Size	Percentage Difference (%)		$\frac{\sum (PD)^2}{N}$	$\sum (PD^2)$
		Sum	Mean		
Less than 10,000 lbs	11	34.0	3.1	105.3	623.1
10,000 - 19,999 lbs	27	23.5	0.9	20.5	3108.9
20,000 - 29,999 lbs	7	16.0	2.3	36.4	78.8
30,000 - 39,999 lbs	7	17.1	2.4	41.8	166.2
TOTALS	52	90.6	1.7	203.9	3976.9

K = No. of classes = 4

Estimate of population variance based entirely on scatter between the group means:

$S_b^2 = 15.4$

Estimate of population variance based entirely on scatter among scores within the groups:

$S_w^2 = 78.6$

$$\frac{S_b^2}{S_w^2} = \frac{15.4}{78.6} = 0.20$$

F value at 5% significance level = 2.81. Therefore at the 5% level reject the null hypothesis and conclude that there is no significant difference between the sample means.

TABLE B.O.3.3 WEIGHT RANGE ANALYSIS FOR TRUCKS

Weight Range	Sample Size	Percentage Difference (%)		Absolute Difference (x 1000 lbs)	
		Mean	S.D.	Mean	S.D.
0 - 39,999 lbs	4	4.3	3.8	1.4	1.2
40,000 - 59,999 lbs	2	-6.5	6.8	-2.8	2.6
60,000 - 69,999 lbs	5	2.3	2.3	1.5	1.4
70,000 - 79,999 lbs	4	2.2	2.7	1.7	2.2
TOTAL	15	1.7	4.6	0.9	2.1

TABLE B.O.3.4 - F-TEST DATA FOR TRUCK WEIGHTS

Weight Range	Sample Size	Percentage Difference (%)		$\frac{\sum (PD)^2}{N}$	$\sum (PD^2)$
		Sum	Mean		
Less than 60,000 lbs	6	65.7	11.0	720.5	2109.3
60,000 - 69,999 lbs	3	2.7	0.9	2.5	369.8
70,000 - 79,999 lbs	21	201.5	9.6	1932.8	4216.6
More than 80,000 lbs	3	1.1	0.4	0.4	169.2
TOTAL	33	271.0	8.2	2656.1	6864.9

K = No. of classes = 4

Estimate of population variance based entirely on scatter between the group means:

$S_b^2 = 55.3$

Estimate of population variance based entirely on scatter among scores within the groups:

$S_w^2 = 12.1$

$$\frac{S_b^2}{S_w^2} = \frac{55.3}{12.1} = 4.58$$

F value at 5% significance level = 3.59. Therefore at the 5% level reject the null hypothesis and conclude that there is a significant difference between the sample means.

TABLE B.O.3.5 - COMPARISON OF INDIVIDUAL AXLE WEIGHT RANGES

Weight Ranges (lbs)	V1	V2	S1	S2	F	F (5%)	F (1%)	
10,000-19,999 / 0-19,999	26	10	10.7	7.5	2.0	2.7	4.3	
0-9,999 / 20,000-29,999	10	6	7.5	3.4	5.1	4.1	7.9	+
0-9,999 / 30,000-39,999	10	6	7.5	4.9	2.4	4.1	7.9	
10,000-19,999 / 20,000-29,999	26	6	10.7	3.4	10.3	3.8	7.3	++
10,000-19,999 / 30,000-39,999	26	6	10.7	4.9	4.9	3.8	7.3	+
30,000-39,999 / 20,000-29,999	6	6	4.9	3.4	2.1	4.3	8.5	

TABLE B.O.3.6 - COMPARISON OF INDIVIDUAL TRUCK WEIGHT RANGES

Weight Ranges (lbs)	V1	V2	S1	S2	F	F (5%)	F (1%)	
40,000-59,999 / 0-39,999	1	3	8.1	5.4	2.3	10.1	34.1	
0-39,999 / 60,000-69,999	3	4	5.4	3.1	3.0	6.6	16.7	
0-39,000 / 80,000-	3	3	5.4	3.2	2.8	9.3	29.5	
40,000-59,999 / 60,000-69,999	1	4	8.1	3.1	6.7	7.7	21.2	
40,000-59,999 / 70,000-79,999	1	3	8.1	3.2	6.4	10.1	34.1	
70,000-79,999 / 80,000-	3	4	3.2	3.1	1.1	6.6	16.7	

SANTA NELLA, CA - MAY 7, 1993 - LOW SPEED WIM

TABLE B.O.3.7 - WEIGHT RANGE ANALYSIS FOR AXLES

Weight Range	Sample Size	Percentage Difference (%)		Absolute Difference (x 1000 lbs)	
		Mean	S.D.	Mean	S.D.
Less than 10,000 lbs	11	-1.9	3.8	-0.2	0.2
10,000 - 19,999 lbs	11	-4.2	2.4	-0.5	0.3
20,000 - 29,999 lbs	2	-5.3	0.9	-1.4	0.1
30,000 - 39,999 lbs	6	-3.8	1.1	-1.2	0.4
TOTAL	30	-3.4	3.0	-0.6	0.5

Mean absolute difference below 10,000 lbs is -200 lbs with a standard deviation of 200 lbs.

Mean percentage difference above 10,000 lbs is -4.2% with a standard deviation of 2.0%.

TABLE B.O.3.8 - F-TEST DATA FOR AXLE WEIGHTS

Weight Range	Sample Size	Percentage Difference (%)		$\frac{\sum (PD)^2}{N}$	$\sum (PD^2)$
		Sum	Mean		
Less than 10,000 lbs	11	-20.4	-1.9	37.9	184.4
10,000 - 19,999 lbs	11	-46.7	-4.2	198.0	257.3
20,000 - 29,999 lbs	2	-10.6	-5.3	56.6	57.3
30,000 - 39,999 lbs	6	-22.9	-3.8	87.0	93.3
TOTALS	30	-100.6	-3.4	379.5	592.3

K = No. of classes = 4

Estimate of population variance based entirely on scatter between the group means:

$S_b^2 = 14.1$

Estimate of population variance based entirely on scatter among scores within the groups:

$S_w^2 = 8.2$

$$\frac{S_b^2}{S_w^2} = \frac{14.1}{8.2} = 1.72$$

F value at 5% significance level = 2.98. Therefore at the 5% level reject the null hypothesis and conclude that there is no significant difference between the sample means.

TABLE B.O.3.9 - WEIGHT RANGE ANALYSIS FOR TRUCKS

Weight Range	Sample Size	Percentage Difference (%)		Absolute Difference (x 1000 lbs)	
		Mean	S.D.	Mean	S.D.
Less than 20,000 lbs	3	-3.4	0.9	-0.6	0.2
20,000 - 49,999 lbs	2	0.3	1.8	0.1	0.5
50,000 - 69,999 lbs	2	-4.4	0.8	-2.8	0.3
More than 70,000 lbs	3	-2.1	3.2	-1.6	2.4
TOTAL	10	-2.5	2.4	-1.2	1.6

TABLE B.O.3.10 - F-TEST DATA FOR AXLE WEIGHTS

Weight Range	Sample Size	Percentage Difference (%)		$\frac{\sum (PD)^2}{N}$	$\sum (PD^2)$
		Sum	Mean		
Less than 20,000 lbs	3	-10.1	-3.4	34.0	35.7
20,000 - 49,999 lbs	2	0.5	0.3	0.1	3.3
50,000 - 69,999 lbs	2	-8.7	-4.4	38.1	38.7
More than 70,000 lbs	3	-6.3	-2.1	13.3	33.3
TOTAL	10	-24.6	-2.5	85.5	111.0

K = No. of classes = 4

Estimate of population variance based entirely on scatter between the group means:

$S_b^2 = 8.3$

Estimate of population variance based entirely on scatter among scores within the groups:

$S_w^2 = 4.3$

$$\frac{S_b^2}{S_w^2} = \frac{8.3}{4.3} = 1.94$$

F value at 5% significance level = 4.76. Therefore at the 5% level reject the null hypothesis and conclude that there is no significant difference between the sample means.

TABLE B.O.3.11 - COMPARISON OF INDIVIDUAL AXLE WEIGHT RANGES

Weight Ranges (lbs)	V1	V2	S1	S2	F	F (5%)	F (1%)	
10,000-19,999 / 0-9,999	10	10	4.8	4.1	1.4	3.0	4.9	
20,000-29,999 /0-9,999	1	10	5.4	4.1	1.7	5.0	10.0	
0-9,999 / 30,000-39,999	10	5	4.1	3.9	1.1	4.7	10.1	
20,000-29,999 / 10,000-19,999	1	10	5.1	4.8	1.1	5.0	10.0	
10,000-19,999 / 30,000-39,999	10	5	4.8	3.9	1.5	4.7	10.1	
20,000-29,999 / 30,000-39,999	1	5	5.4	3.9	1.8	6.6	16.3	

TABLE B.O.3.12 - COMPARISON OF INDIVIDUAL TRUCK WEIGHT RANGES

Weight Ranges (lbs)	V1	V2	S1	S2	F	F (5%)	F (1%)	
0-19,999 /20,000-49,999	2	1	3.5	1.3	7.2	200.0	5000.0	
50,000-69,999 / 0-19,999	1	2	4.4	3.5	1.6	18.5	98.5	
0-19,000 / 70,000-	2	2	3.5	3.3	1.1	19.0	99.0	
50,000-69,999 / 20,000-49,999	1	1	4.4	1.3	11.6	161.0	4052.0	
70,000- / 20,000-49,999	2	1	3.3	1.3	6.7	200.0	5000.0	
60,000-69,999 / 70,000-	1	2	4.4	1.3	1.7	18.5	98.5	

SANTA NELLA, CA - JUNE 29, 1993 - LOW SPEED WIM

TABLE B.O.3.13 -WEIGHT RANGE ANALYSIS FOR AXLES

Weight Range	Sample Size	Percentage Difference (%)		Absolute Difference (x 1000 lbs)	
		Mean	S.D.	Mean	S.D.
Less than 10,000 lbs	17	1.8	3.0	0.1	0.3
10,000 - 19,999 lbs	30	1.9	3.0	0.2	0.4
20,000 - 29,999 lbs	12	2.2	3.1	0.5	0.7
30,000 - 39,999 lbs	12	1.3	2.4	0.4	0.8
TOTAL	71	1.8	2.9	0.3	0.5

Mean absolute difference below 10,000 lbs is 100 lbs with a standard deviation of 300 lbs.

Mean percentage difference above 10,000 lbs is 1.8% with a standard deviation of 2.9%.

TABLE B.O.3.14 - F-TEST DATA FOR AXLE WEIGHTS

Weight Range	Sample Size	Percentage Difference (%)		$\frac{\sum (PD)^2}{N}$	$\sum (PD^2)$
		Sum	Mean		
Less than 10,000 lbs	17	31.1	1.8	56.9	196.1
10,000 - 19,999 lbs	30	57.8	1.9	111.2	377.0
20,000 - 29,999 lbs	12	27.0	2.2	60.6	163.7
30,000 - 39,999 lbs	12	15.0	1.3	18.8	79.7
TOTALS	71	130.8	1.8	247.5	816.5

K = No. of classes = 4

Estimate of population variance based entirely on scatter between the group means:

$S_b^2 = 2.1$

Estimate of population variance based entirely on scatter among scores within the groups:

$S_w^2 = 8.5$

$$\frac{S_b^2}{S_w^2} = \frac{2.1}{8.5} = 0.25$$

F value at 5% significance level = 2.73. Therefore at the 5% level reject the null hypothesis and conclude that there is no significant difference between the sample means.

TABLE B.O.3.15 - WEIGHT RANGE ANALYSIS FOR TRUCKS

Weight Range	Sample Size	Percentage Difference (%)		Absolute Difference (x 1000 lbs)	
		Mean	S.D.	Mean	S.D.
30,000 - 39,999 lbs	5	4.5	1.6	1.6	0.5
40,000 - 49,999 lbs	2	3.6	0.7	1.8	0.4
50,000 - 59,999 lbs	4	2.8	2.1	1.4	1.1
60,000 - 69,999 lbs	2	2.0	2.4	1.3	1.6
More than 70,000 lbs	8	0.7	1.7	0.5	1.2
TOTALS	21	2.4	2.2	1.1	1.1

TABLE B.O.3.16 - F-TEST DATA FOR AXLE WEIGHTS

Weight Range	Sample Size	Percentage Difference (%)		$\frac{\sum (PD)^2}{N}$	$\sum (PD^2)$
		Sum	Mean		
30,000 - 39,999 lbs	5	22.4	4.5	100.0	110.4
40,000 - 49,999 lbs	2	7.1	3.6	25.4	25.9
50,000 - 59,999 lbs	4	11.1	2.8	30.5	43.8
60,000 - 69,999 lbs	2	4.0	2.0	8.1	14.1
More than 70,000 lbs	8	5.9	0.7	4.3	23.6
TOTAL	21	50.5	2.4	168.4	217.7

K = No. of classes = 5

Estimate of population variance based entirely on scatter between the group means:

$S_b^2 = 11.8$

Estimate of population variance based entirely on scatter among scores within the groups:

$$S_w^2 = 3.1$$

$$\frac{S_b^2}{S_w^2} = \frac{11.8}{3.1} = 3.82$$

F value at 5% significance level = 3.01. Therefore at the 5% level reject the null hypothesis and conclude that there is a significant difference between the sample means.

TABLE B.O.3.17 - COMPARISON OF INDIVIDUAL AXLE WEIGHT RANGES

Weight Ranges (lbs)	V1	V2	S1	S2	F	F (5%)	F (1%)	
10,000-9,999 / 0-9,999	29	16	3.6	3.4	1.1	2.2	3.1	
20,000-9,999 / 0-9,999	11	16	3.7	3.4	1.2	2.5	3.6	
0-9,999 / 30,000-39,999	16	11	3.4	2.6	1.7	2.7	4.2	
20,000-29,999 / 10,000-19,999	11	29	3.7	3.6	1.1	2.1	2.9	
10,000-19,999 / 30,000-39,999	29	11	3.6	2.6	1.9	2.6	4.0	
20,000-29,999 / 30,000-39,999	11	11	3.7	2.6	2.0	2.8	4.5	

TABLE B.O.3.18 - COMPARISON OF INDIVIDUAL TRUCK WEIGHT RANGES

Weight Ranges (lbs)	V1	V2	S1	S2	F	F (5%)	F (1%)	
30,000-39,000 / 40,000-49,999	4	1	4.7	3.6	1.7	225.0	5625.0	
30,000-39,000 / 50,000-59,999	4	3	4.7	3.3	2.0	9.1	28.7	
30,000-39,000 / 60,000-69,999	4	1	4.7	2.7	3.1	225.0	5625.0	
30,000-39,000 / 70,000-	4	7	4.7	1.8	6.6	4.1	7.9	+
40,000-49,000 / 50,000-59,999	1	3	3.6	3.3	1.2	10.1	34.1	
40,000-49,000 / 60,000-69,999	1	1	3.6	2.7	1.8	161.0	4052.0	
40,000-49,000 / 70,000-	1	7	3.6	1.8	3.9	5.6	12.2	
50,000-59,999 / 60,000-69,999	3	1	3.3	2.7	1.6	216.0	5403.0	
50,000-59,999 / 70,000-	3	7	3.3	1.8	3.3	4.4	8.5	
60,000-69,999 / 70,000-	1	7	2.7	1.8	2.1	5.6	12.2	

SANTA NELLA, CA - JUNE 30, 1993 - LOW SPEED WIM

TABLE B.O.3.19 - WEIGHT RANGE ANALYSIS FOR AXLES

Weight Range	Sample Size	Percentage Difference (%)		Absolute Difference (x 1000 lbs)	
		Mean	S.D.	Mean	S.D.
Less than 10,000 lbs	13	2.3	3.9	0.2	0.3
10,000 - 19,999 lbs	51	1.4	2.8	0.2	0.4
20,000 - 29,999 lbs	7	0.7	2.3	0.2	0.6
30,000 - 39,999 lbs	21	1.4	2.2	0.4	0.7
TOTAL	92	1.5	2.8	0.3	0.5

Mean absolute difference below 10,000 lbs is 200 lbs with a standard deviation of 300 lbs.

Mean percentage difference above 10,000 lbs is 1.4% with a standard deviation of 2.6%.

TABLE B.O.3.20 - F-TEST DATA FOR AXLE WEIGHTS

Weight Range	Sample Size	Percentage Difference (%)		$\frac{\sum (PD)^2}{N}$	$\sum (PD^2)$
		Sum	Mean		
Less than 10,000 lbs	13	30.4	2.3	70.9	252.4
10,000 - 19,999 lbs	51	73.8	1.4	106.9	496.1
20,000 - 29,999 lbs	7	5.0	0.7	3.6	35.6
30,000 - 39,999 lbs	21	28.5	1.4	38.8	136.1
TOTALS	92	137.8	1.5	220.2	920.2

K = No. of classes = 4

Estimate of population variance based entirely on scatter between the group means: $S_b^2 = 4.6$

Estimate of population variance based entirely on scatter among scores within the groups:

$$S_w^2 = 8.0$$

$$\frac{S_b^2}{S_w^2} = \frac{4.6}{8.0} = 0.58$$

F value at 5% significance level = 2.71. Therefore at the 5% level reject the null hypothesis and conclude that there is no significant difference between the sample means.

TABLE B.O.3.21 - WEIGHT RANGE ANALYSIS FOR TRUCKS

Weight Range	Sample Size	Percentage Difference (%)		Absolute Difference (x 1000 lbs)	
		Mean	S.D.	Mean	S.D.
0 - 39,999 lbs	3	1.8	1.0	0.5	0.4
60,000 - 69,999 lbs	2	2.1	3.2	1.4	2.2
70,000 - 79,999 lbs	16	1.8	1.8	1.4	1.4
More than 80,000 lbs	4	0.3	0.9	0.3	0.7
TOTALS	25	1.6	1.7	1.1	1.3

TABLE B.O.3.22 - F-TEST DATA FOR TRUCK WEIGHTS

Weight Range	Sample Size	Percentage Difference (%)		$\frac{\sum (PD)^2}{N}$	$\sum (PD^2)$
		Sum	Mean		
0 - 39,999 lbs	3	5.3	1.8	9.4	11.3
60,000 - 69,999 lbs	2	4.2	2.1	8.8	19.0
70,000 - 79,999 lbs	16	29.0	1.8	52.7	99.5
More than 80,000 lbs	4	1.4	0.3	0.5	2.7
TOTAL	25	39.9	1.6	71.4	132.5

K = No. of classes = 4

Estimate of population variance based entirely on scatter between the group means:

$$S_b^2 = 2.5$$

Estimate of population variance based entirely on scatter among scores within the groups:

$$S_w^2 = 2.9$$

$$\frac{S_b^2}{S_w^2} = \frac{2.5}{2.9} = 0.87$$

F value at 5% significance level = 2.84. Therefore at the 5% level reject the null hypothesis and conclude that there is no significant difference between the sample means.

TABLE B.O.3.23 - COMPARISON OF INDIVIDUAL AXLE WEIGHT RANGES

Weight Ranges (lbs)	V1	V2	S1	S2	F	F (5%)	F (1%)	
0-9,999 / 10,000-19,999	12	50	4.4	3.1	2.0	2.0	2.6	
0-9,999 / 20,000-29,999	12	6	4.4	2.3	3.8	4.0	7.7	
0-9,999 / 30,000-39,999	12	21	4.4	2.6	3.0	2.3	3.2	+
10,000-19,999 / 20,000-29,999	50	6	3.1	2.3	1.9	3.8	7.1	
10,000-19,999 / 30,000-39,999	50	21	3.1	2.6	1.5	1.9	2.6	
30,000-39,999 / 20,000-29,999	20	6	2.6	2.3	1.3	3.9	7.4	

TABLE B.O.3.24 - COMPARISON OF INDIVIDUAL TRUCK WEIGHT RANGES

Weight Ranges (lbs)	V1	V2	S1	S2	F	F (5%)	F (1%)	
60,000-69,999 / 0-39,999	1	2	3.1	1.9	2.6	18.5	98.5	
70,000-79,999 / 0-39,999	15	2	2.5	1.9	1.7	19.4	99.4	
0-39,000 / 80,000-	2	3	1.9	0.8	5.4	9.6	30.8	
60,000-69,999 / 70,000-79,999	1	15	3.1	2.5	1.5	4.5	8.7	
60,000-69,999 / 80,000-	1	3	3.1	0.8	14.2	10.1	34.1	+
70,000-79,999 / 80,000-	15	3	2.5	0.8	9.2	8.7	26.9	+

WEIGHT SCREENING ANALYSIS

This section of Annex B presents graphs relating to the weight screening analysis that has been undertaken. For each site these graphs illustrate the efficiency of the weight screening process given the observed accuracy of the WIM's dynamic weight measurements and the distribution of vehicle and axle weights.

For each on-site evaluation sixteen graphs are shown. These consist of four graphs for each of the weight screening analyses for the following weight categories:

* gross vehicle weight;
* front axle weight;
* single axle weights, which do not include the front axles of vehicles or axles contained with tandem axle combinations; and
* tandem axles weights.

The four graphs presented for each set of weight screening analysis are as follows:

* Weight distribution for gross vehicle/single axle/tandem axle weights. This graph shows a weight distribution for the particular class of weight being examined, such as the gross vehicle weights. The weight distribution have been generated using WIM weight data recorded on the day of the on-site evaluation.

  From the analysis of static and dynamic weights, it can be seen that some of the WIM systems are not in calibration. To make an allowance forthe discrepancies between static and dynamic weights, the WIM weight data have been adjusted by the mean percentage difference found between the static and dynamic weights. The adjustments performed utilized the relevant mean percentage difference for either vehicle weights or axle weights. The resulting distribution enables the calculation

of the total proportion of overweight vehicles and the proportion of vehicles at any weight.

* Comparative effects of different screening: weight limits. This graph shows the proportion of legally laden vehicles that are unnecessarily stopped plotted against the proportion of overweight vehicles that escape detection by the WIM system for particular screening weight limits.

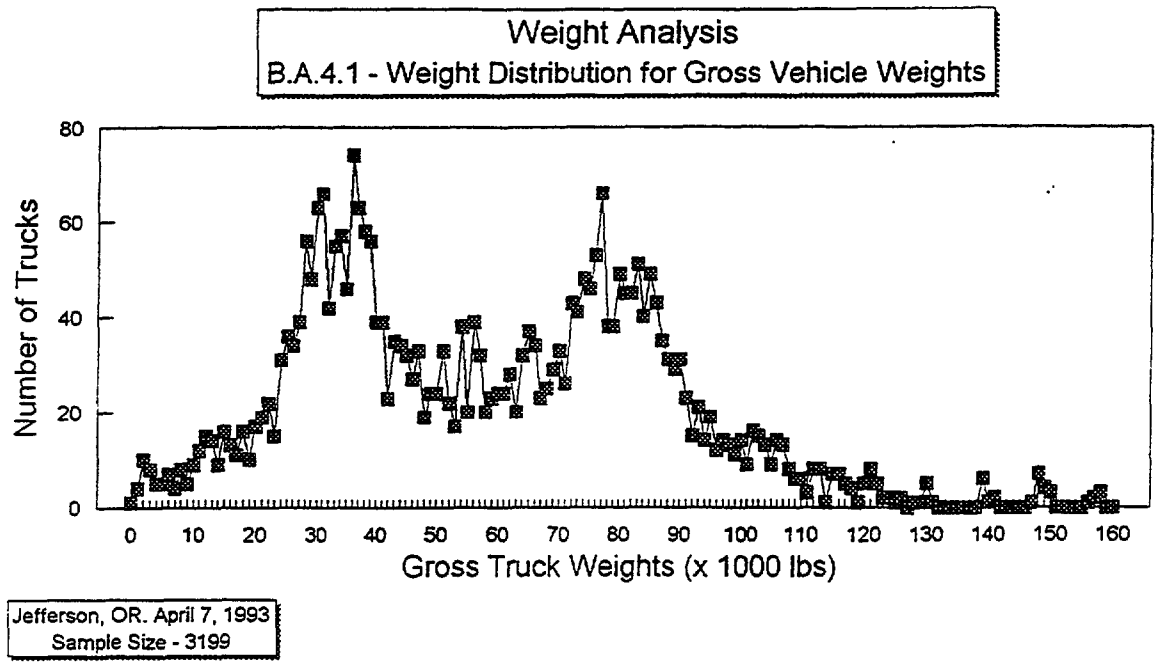
  The points plotted on this graph relate the proportions found at specific screening weight limits. This graph shows the relation between these two proportions of vehicles as the screening weight limit is adjusted. Under an ideal scenario with an accurate WIM system the screening weight limit would be set to the legal weight limit and only overweight vehicles would be directed for static weighing. However, given that the WIM system has some measurement variations the screening weight limit requires adjustment to enable a practical screening procedure to be undertaken.

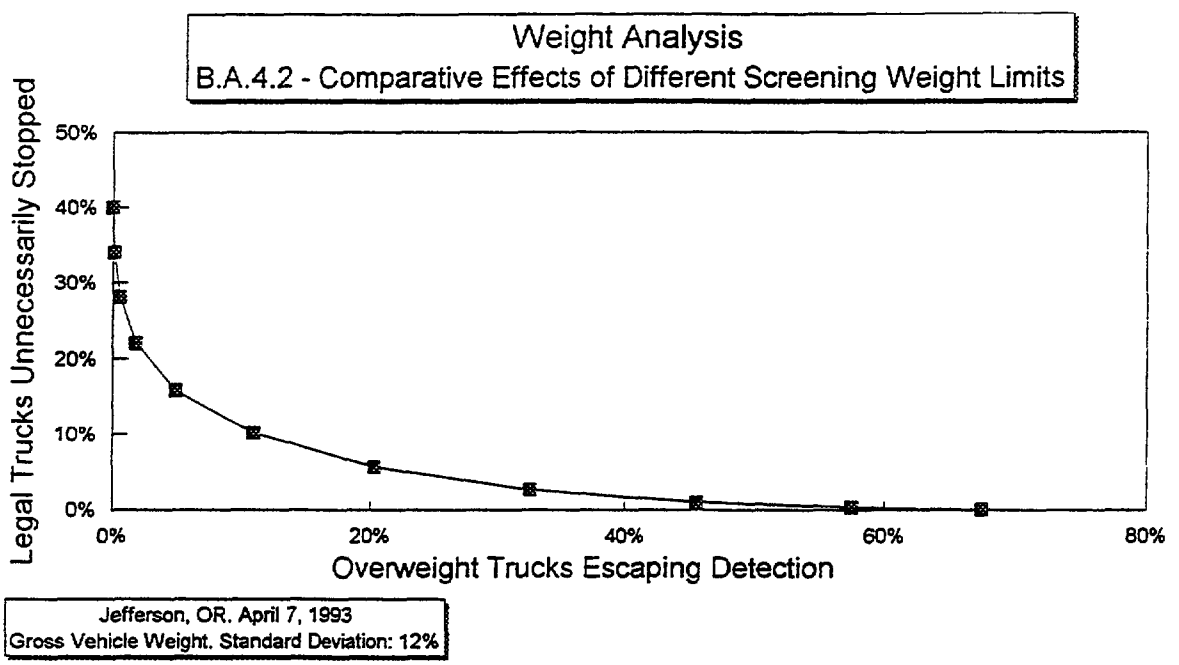
* Overweight trucks escaping detection for gross vehicle weight. etc. This graph presents the proportion of overweight trucks that escape detection by the WIM system. Due to the inaccuracies within weight measurements by the WIM system a proportion of vehicles that have gross vehicle weights or axle weights that are over the legal weight limit will escape detection. The screening weight limit can be adjusted on the WIM system. It can be seen that a lower screening weight limit reduces the probability that an overweight vehicle will escape detection, therefore reducing the proportion of overweight vehicles that escape detection.

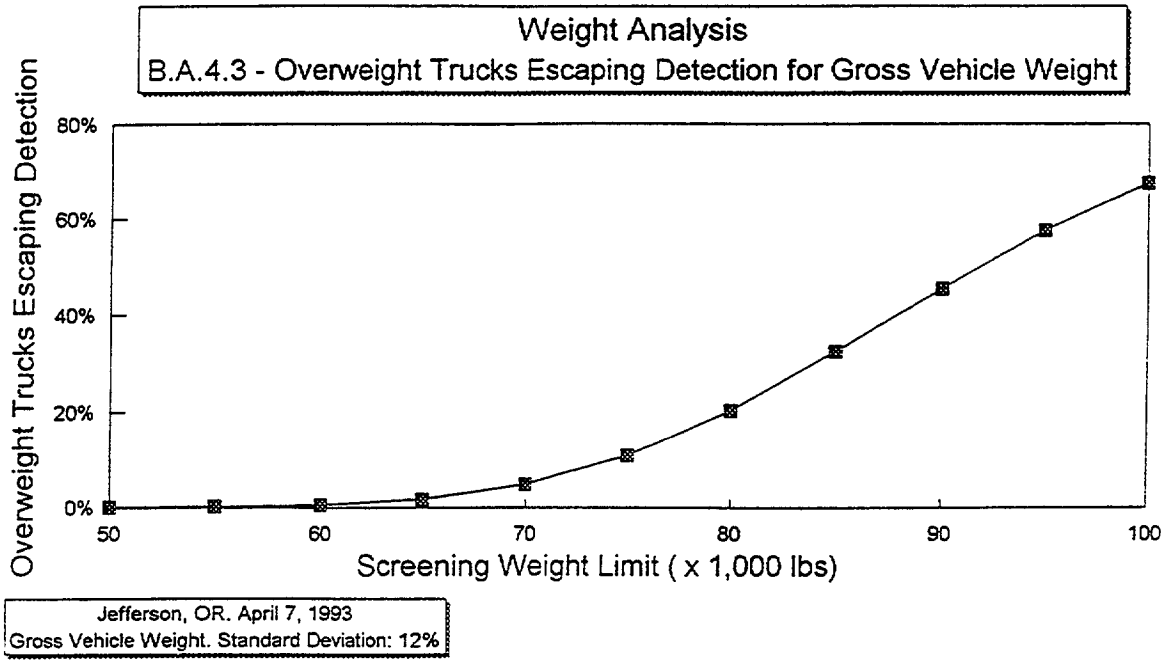
* Legally laden trucks unnecessarily stopped for gross vehicle weight, etc. This graph shows the proportion of legally laden trucks that are unnecessarily stopped and directed for static weighing. Due to the inaccuracies within weight measurements by the WIM system a proportion of vehicles that have gross vehicle

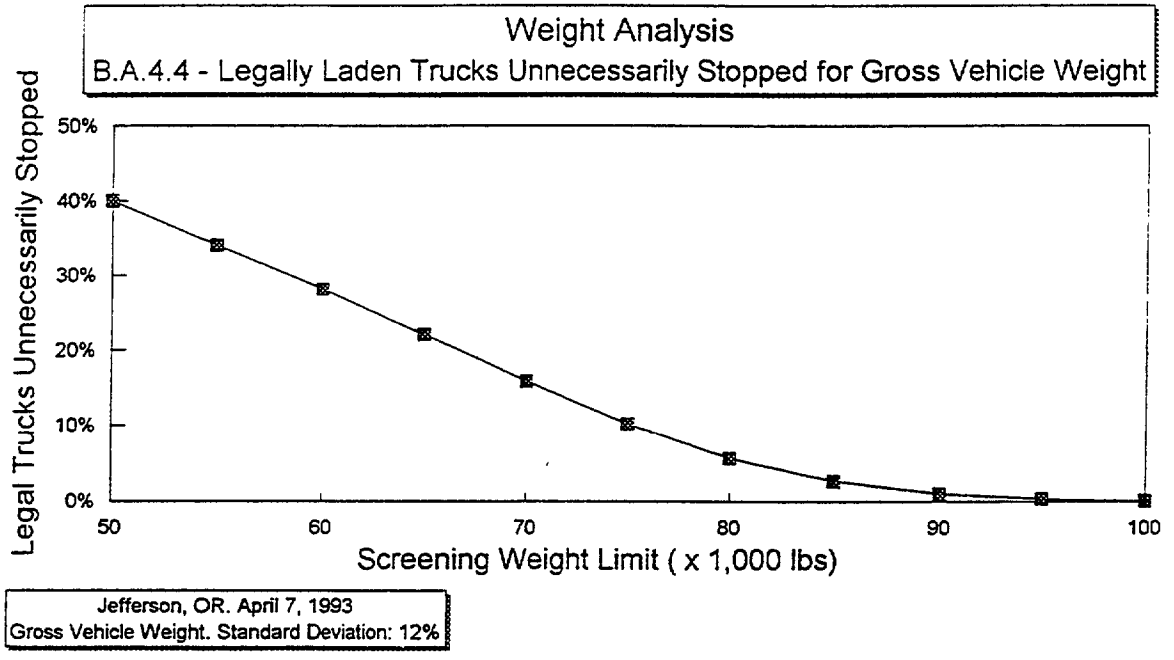
weights or axle weights under the legal weight limit will be unnecessarily directed for static weighing. It can be seen that a lower screening weight limit increases the probability that a legally laden vehicle will be unnecessarily stopped, increasing the number of delayed vehicles.

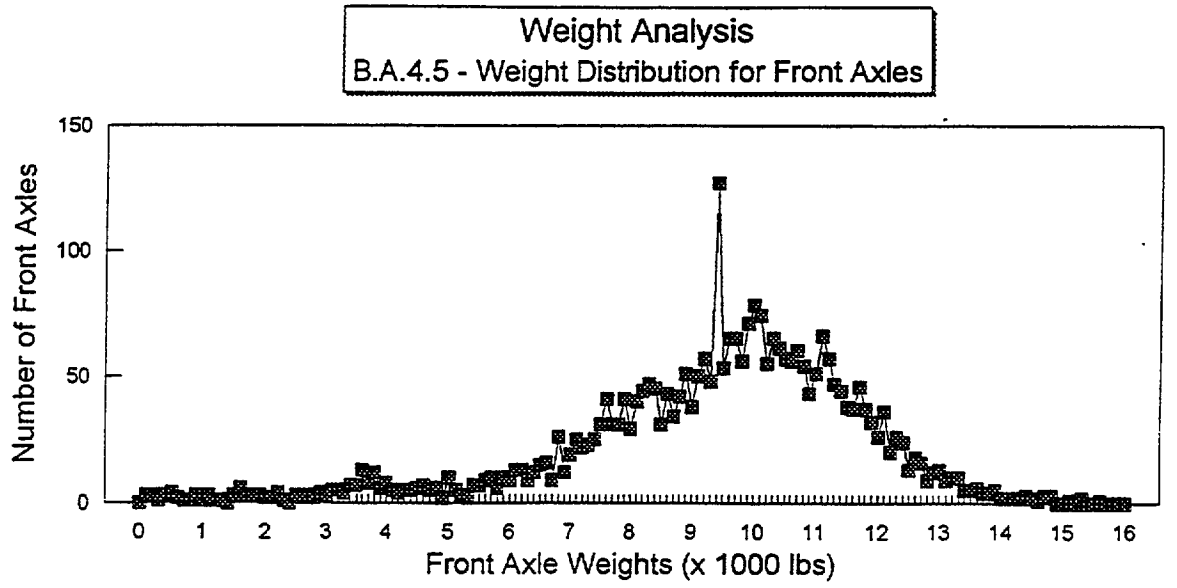
The relationship between these two vehicle proportions and the screening weight limit results in a conflict. A screening weight limit set to a low level will enable few overweight vehicles to escape detection, however it will also identify a large proportion of legally laden vehicles as being overweight by the WIM's measurement. This reduces the efficiency of dynamic weight screening. The operating authority has to decide a pragmatic policy that will enable efficient weight screening with a suitable enforcement level without the need to statically weigh large numbers of vehicles.

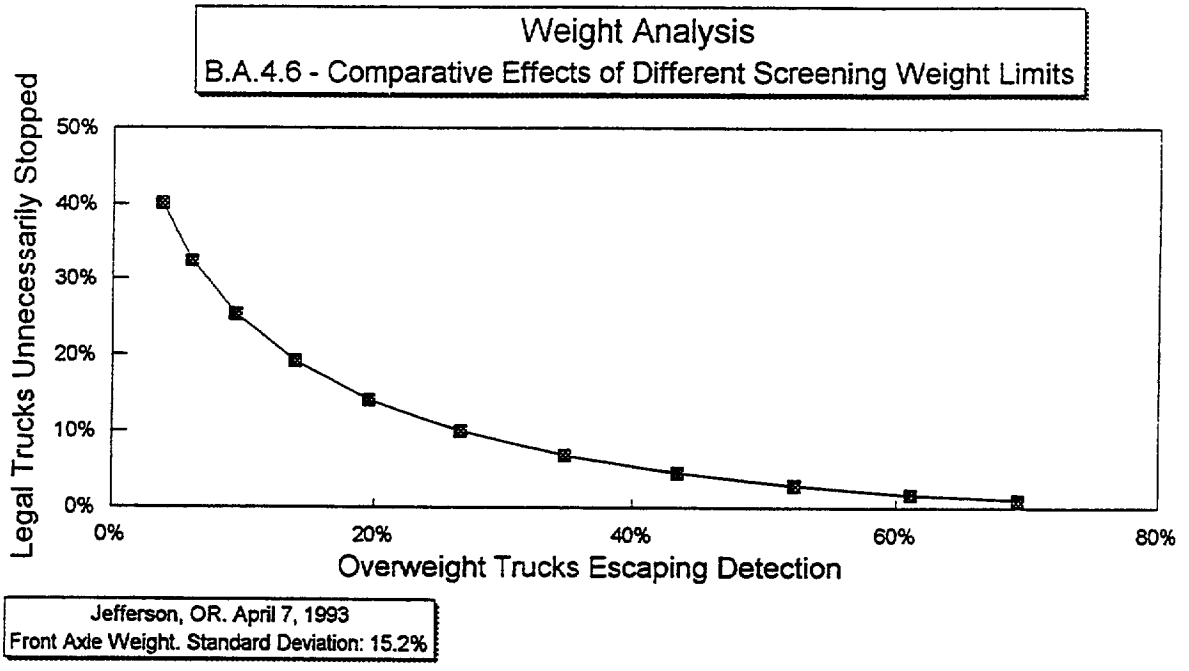

Weight Analysis
B.A.4.1 - Weight Distribution for Gross Vehicle Weights
Number of Trucks
0
20
40
60
80
0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160
Gross Truck Weights (x 1000 lbs)
Jefferson, OR. April 7, 1993
Sample Size - 3199

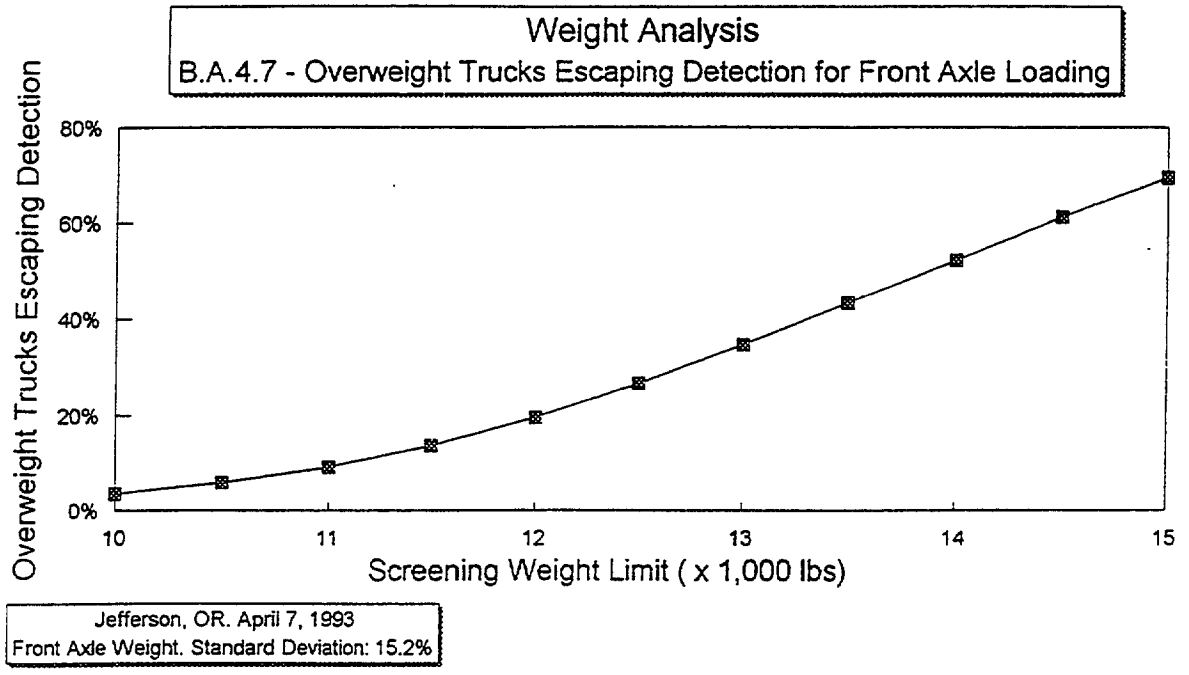

Weight Analysis
B.A.4.2 - Comparative Effects of Different Screening Weight Limits
Legal Trucks Unnecessarily Stopped
0%
10%
20%
30%
40%
50%
0% 20% 40% 60% 80%
Overweight Trucks Escaping Detection
Jefferson, OR. April 7, 1993
Gross Vehicle Weight. Standard Deviation: 12%

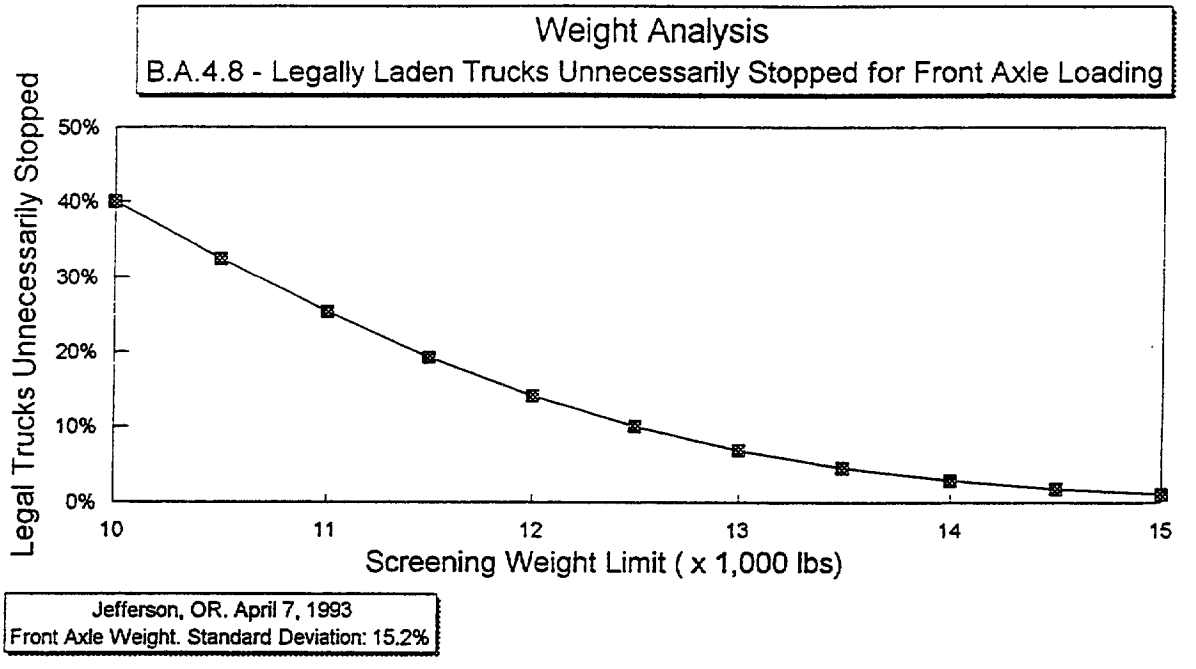

Weight Analysis
B.A.4.3 - Overweight Trucks Escaping Detection for Gross Vehicle Weight
Overweight Trucks Escaping Detection
80%
60%
40%
20%
0%
50
60
70
80
90
100
Screening Weight Limit (x 1,000 lbs)
Jefferson, OR. April 7, 1993
Gross Vehicle Weight. Standard Deviation: 12%

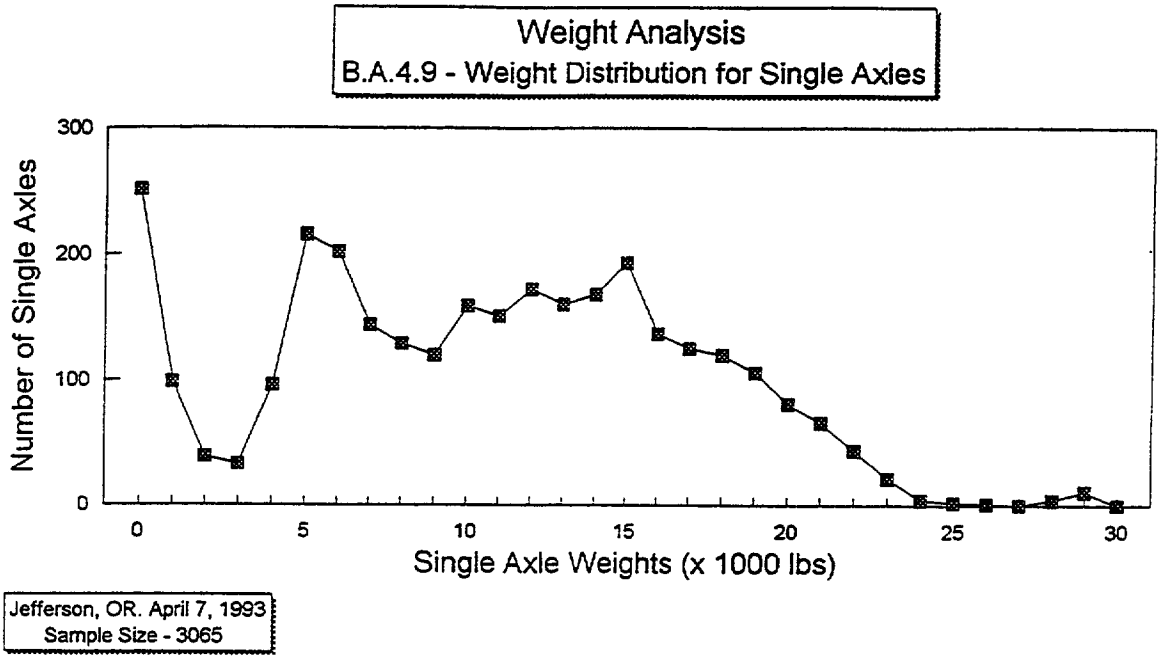

Weight Analysis
B.A.4.4 - Legally Laden Trucks Unnecessarily Stopped for Gross Vehicle Weight
Legal Trucks Unnecessarily Stopped
50%
40%
30%
20%
10%
0%
50
60
70
80
90
100
Screening Weight Limit (x 1,000 lbs)
Jefferson, OR. April 7, 1993
Gross Vehicle Weight. Standard Deviation: 12%

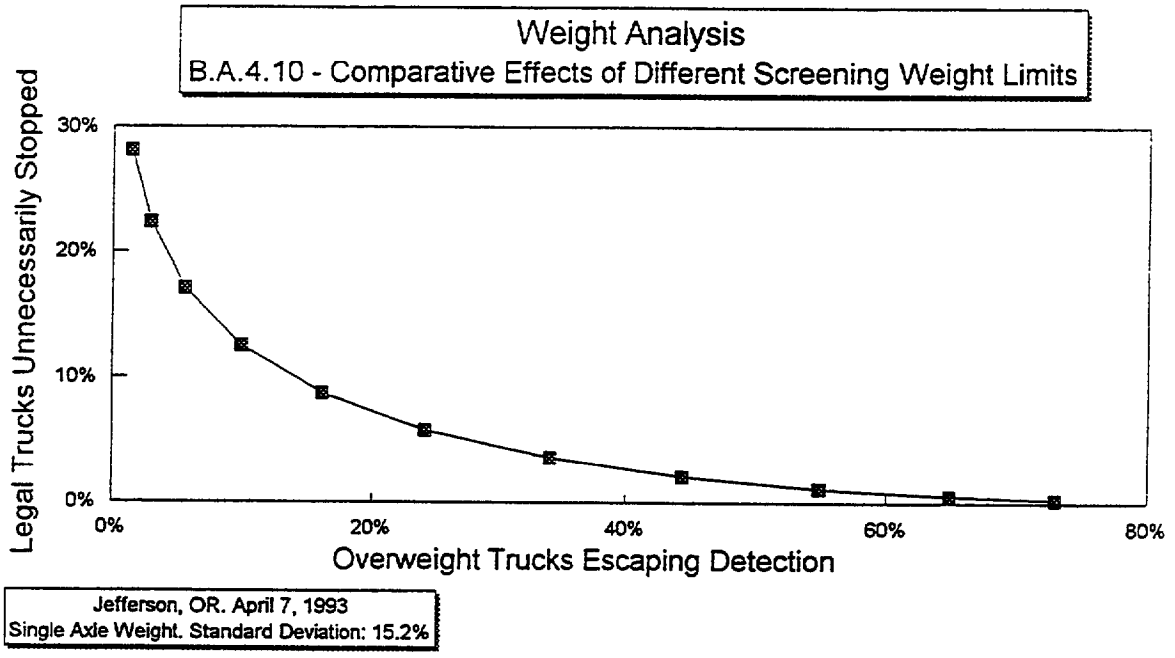

Weight Analysis
B.A.4.5 - Weight Distribution for Front Axles
Number of Front Axles
150
100
50
0
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
Front Axle Weights (x 1000 lbs)
Jefferson, OR. April 7, 1993
Sample Size - 3074

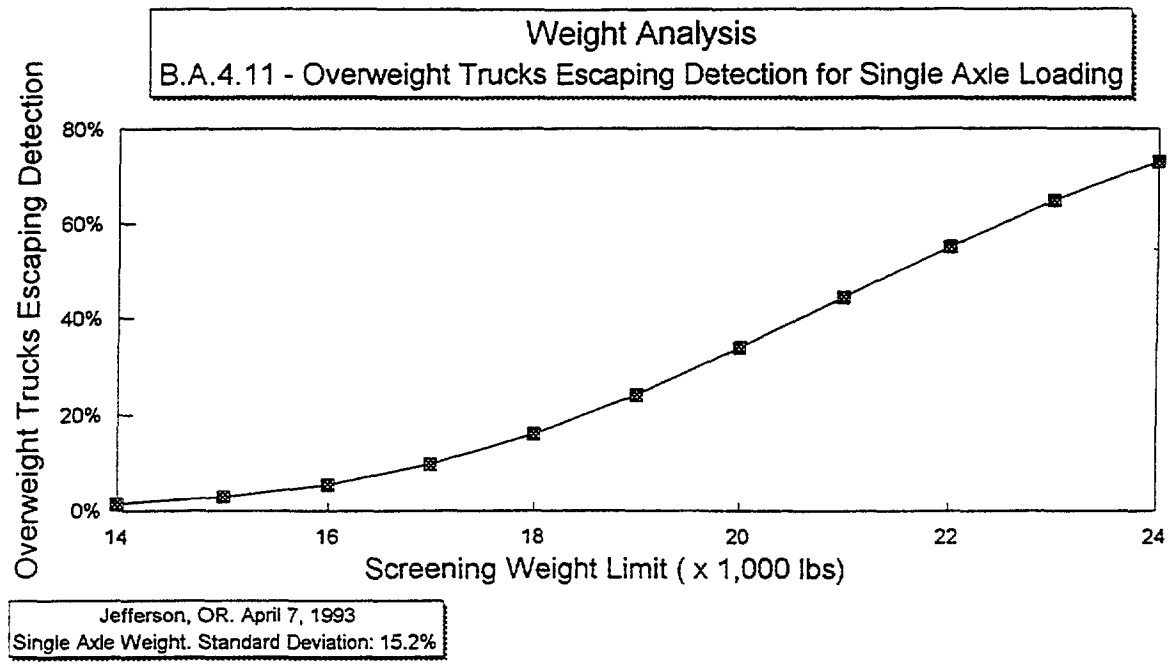

Weight Analysis
B.A.4.6 - Comparative Effects of Different Screening Weight Limits
Legal Trucks Unnecessarily Stopped
50%
40%
30%
20%
10%
0%
0% 20% 40% 60% 80%
Overweight Trucks Escaping Detection
Jefferson, OR. April 7, 1993
Front Axle Weight. Standard Deviation: 15.2%

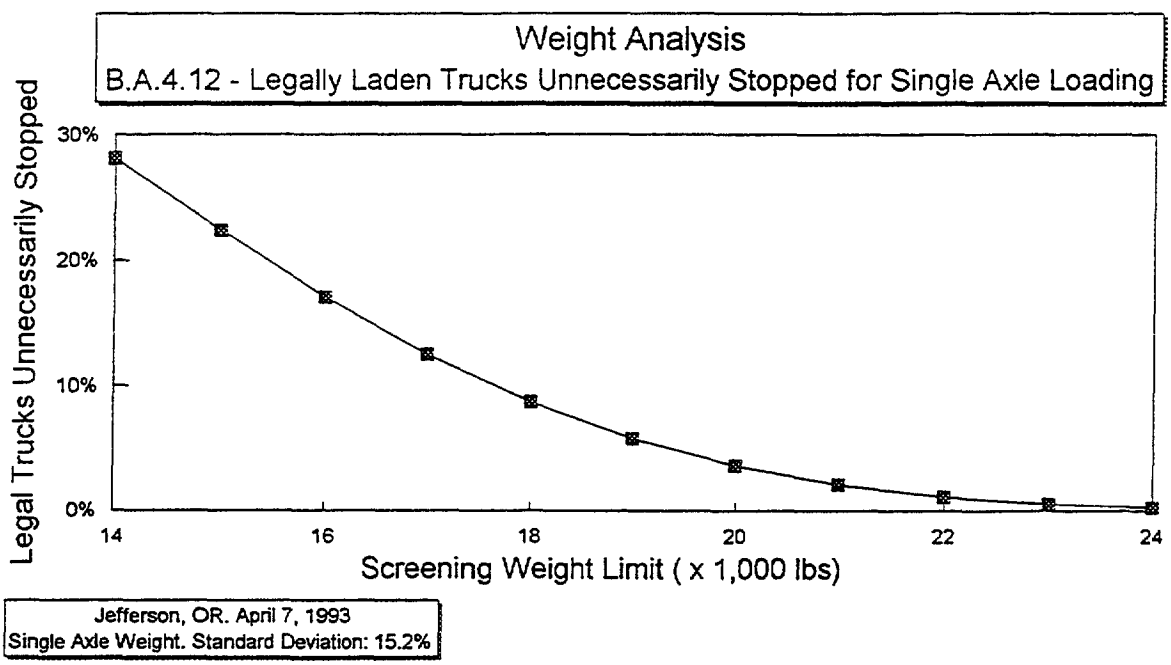

Weight Analysis
B.A.4.7 - Overweight Trucks Escaping Detection for Front Axle Loading
Overweight Trucks Escaping Detection
80%
60%
40%
20%
0%
10
11
12
13
14
15
Screening Weight Limit (x 1,000 lbs)
Jefferson, OR. April 7, 1993
Front Axle Weight. Standard Deviation: 15.2%

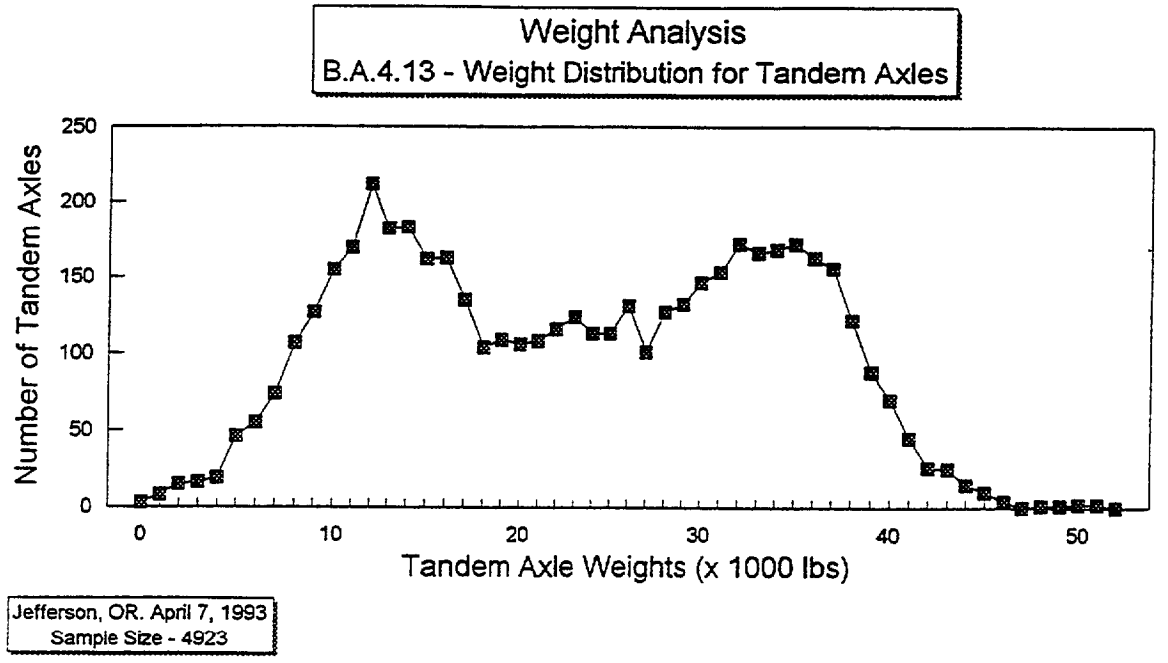

Weight Analysis
B.A.4.8 - Legally Laden Trucks Unnecessarily Stopped for Front Axle Loading
Legal Trucks Unnecessarily Stopped
50%
40%
30%
20%
10%
0%
10
11
12
13
14
15
Screening Weight Limit (x 1,000 lbs)
Jefferson, OR. April 7, 1993
Front Axle Weight. Standard Deviation: 15.2%

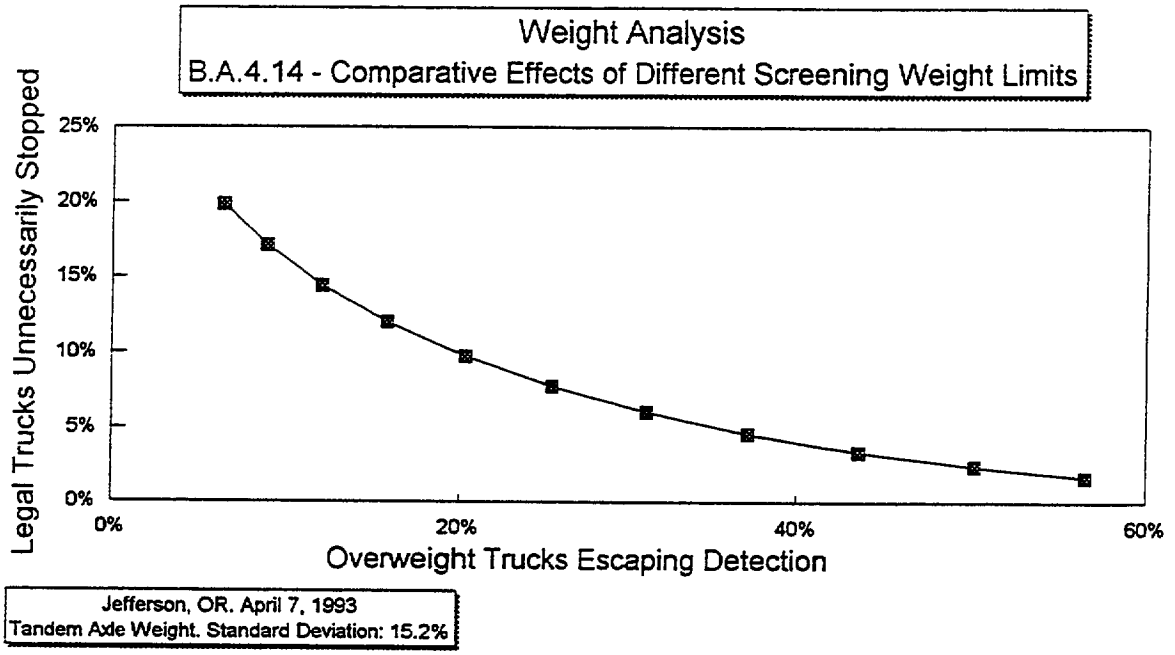

Weight Analysis
B.A.4.9 - Weight Distribution for Single Axles
Number of Single Axles
300
200
100
0
0
5
10
15
20
25
30
Single Axle Weights (x 1000 lbs)
Jefferson, OR. April 7, 1993
Sample Size - 3065

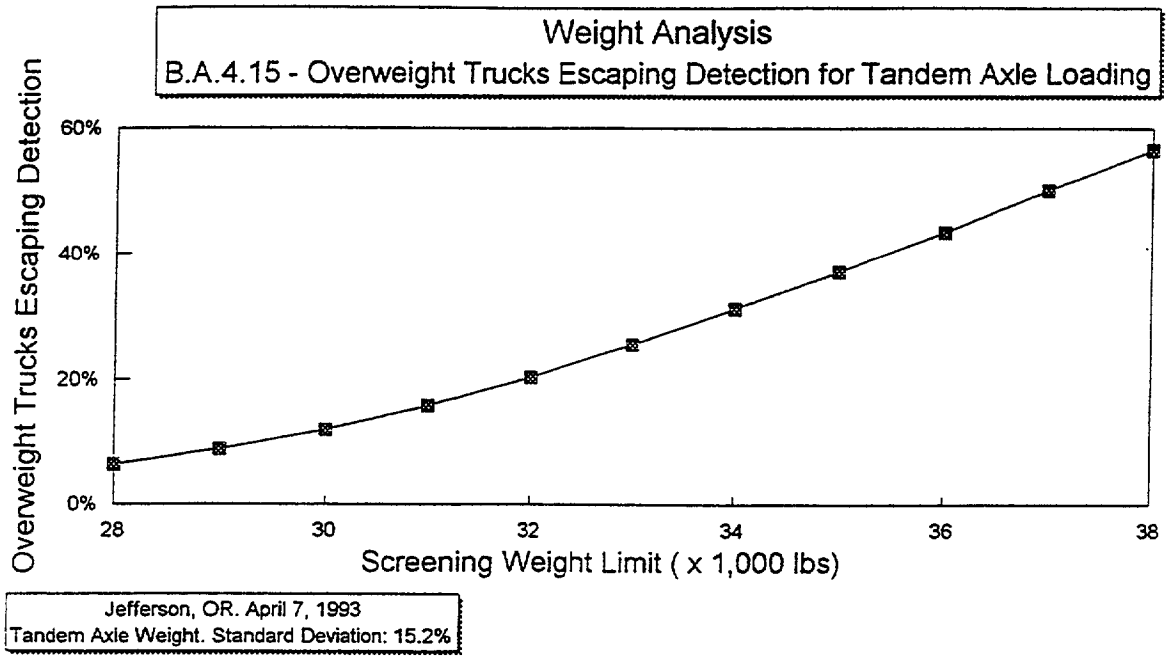

Weight Analysis
B.A.4.10 - Comparative Effects of Different Screening Weight Limits
Legal Trucks Unnecessarily Stopped
30%
20%
10%
0%
0%
20%
40%
60%
80%
Overweight Trucks Escaping Detection
Jefferson, OR. April 7, 1993
Single Axle Weight. Standard Deviation: 15.2%

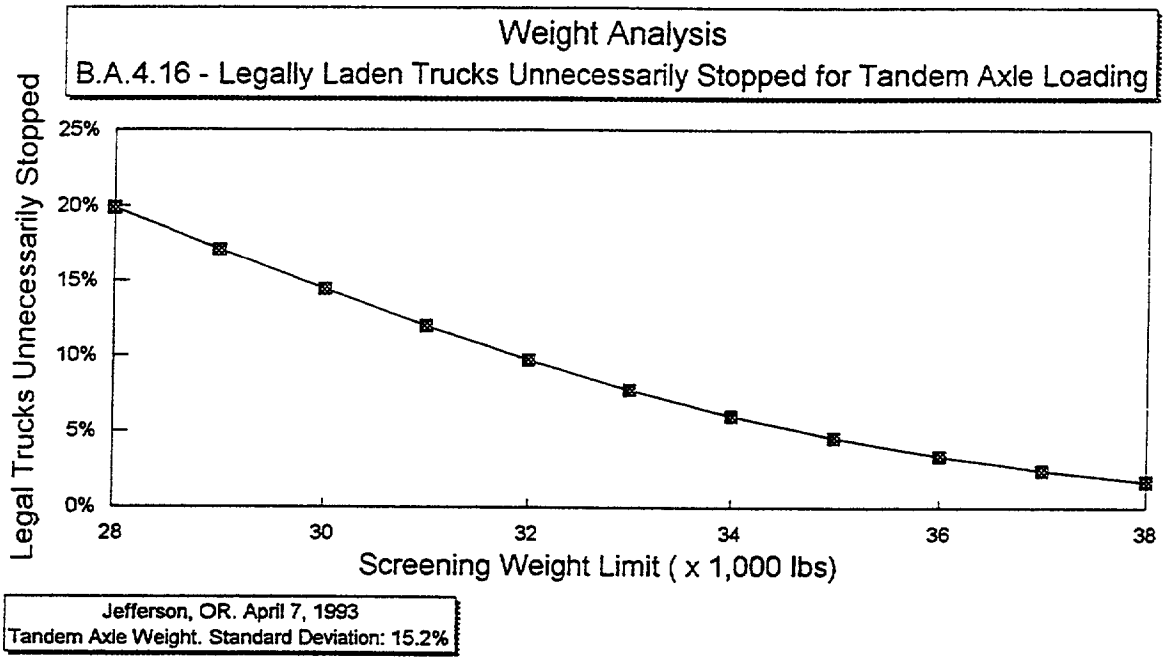

Weight Analysis
B.A.4.11 - Overweight Trucks Escaping Detection for Single Axle Loading
Overweight Trucks Escaping Detection
80%
60%
40%
20%
0%
14
16
18
20
22
24
Screening Weight Limit (x 1,000 lbs)
Jefferson, OR. April 7, 1993
Single Axle Weight. Standard Deviation: 15.2%

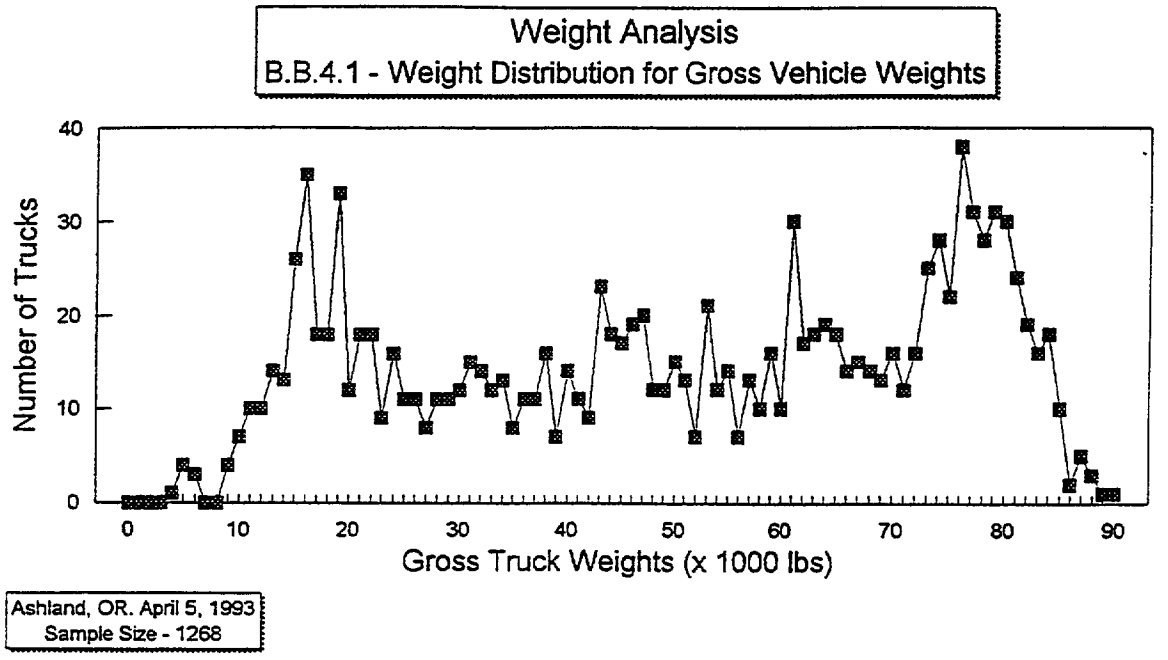

Weight Analysis
B.A.4.12 - Legally Laden Trucks Unnecessarily Stopped for Single Axle Loading
Legal Trucks Unnecessarily Stopped
30%
20%
10%
0%
14
16
18
20
22
24
Screening Weight Limit (x 1,000 lbs)
Jefferson, OR. April 7, 1993
Single Axle Weight. Standard Deviation: 15.2%

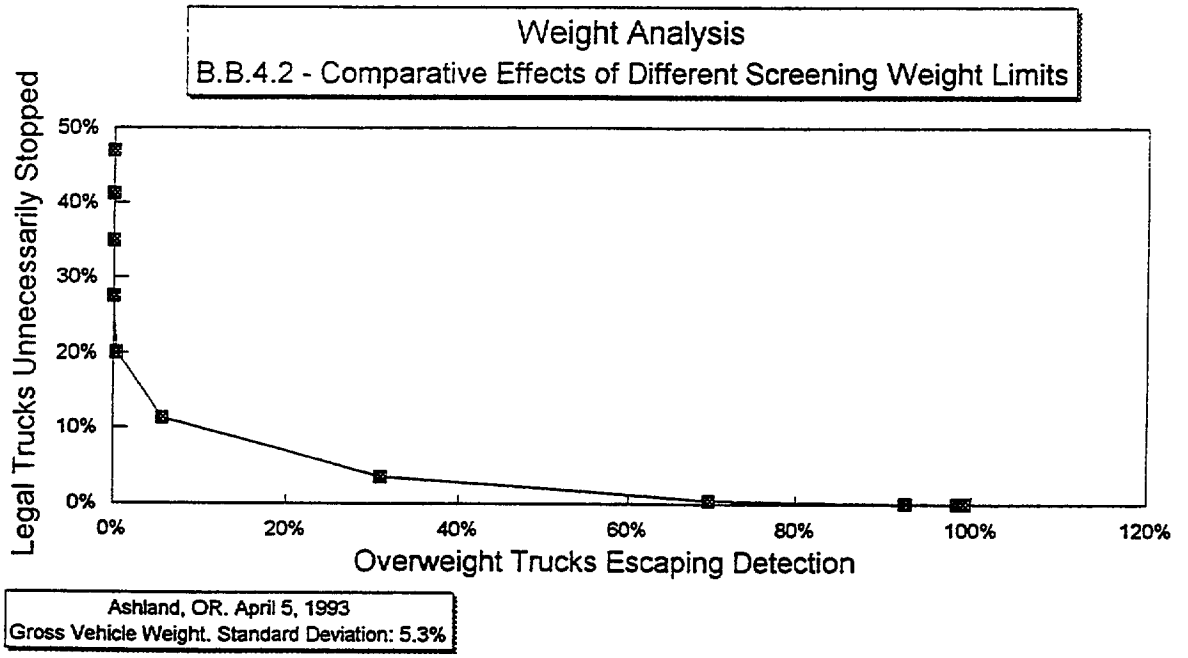

Weight Analysis
B.A.4.13 - Weight Distribution for Tandem Axles
Number of Tandem Axles
250
200
150
100
50
0
0
10
20
30
40
50
Tandem Axle Weights (x 1000 lbs)
Jefferson, OR. April 7, 1993
Sample Size - 4923

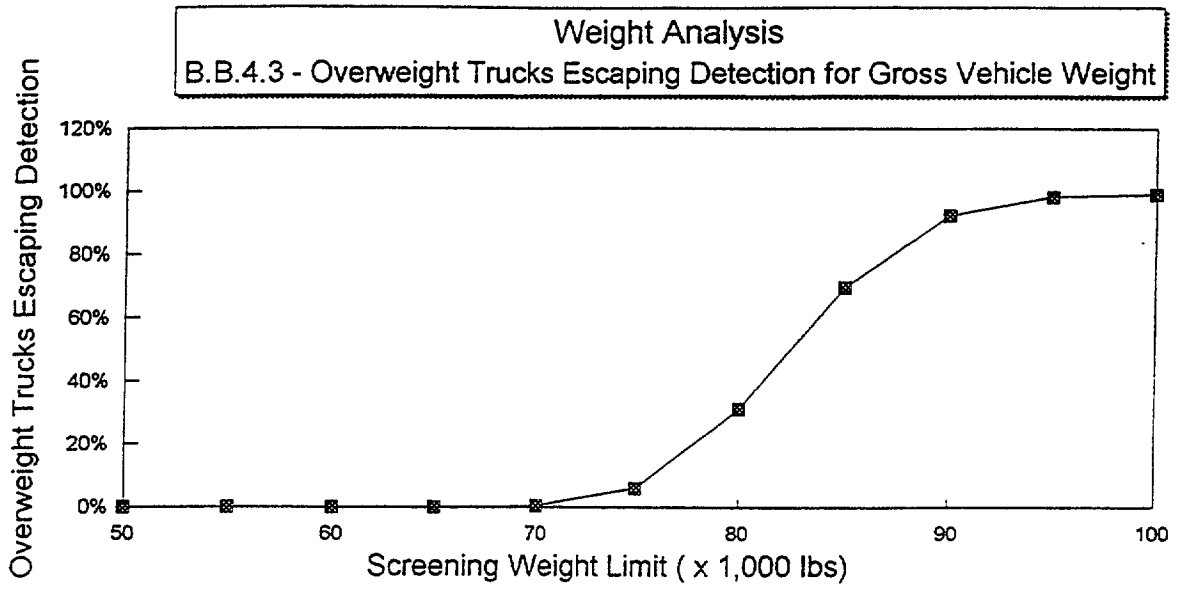

Weight Analysis
B.A.4.14 - Comparative Effects of Different Screening Weight Limits
Legal Trucks Unnecessarily Stopped
25%
20%
15%
10%
5%
0%
0%
20%
40%
60%
Overweight Trucks Escaping Detection
Jefferson, OR. April 7, 1993
Tandem Axle Weight. Standard Deviation: 15.2%

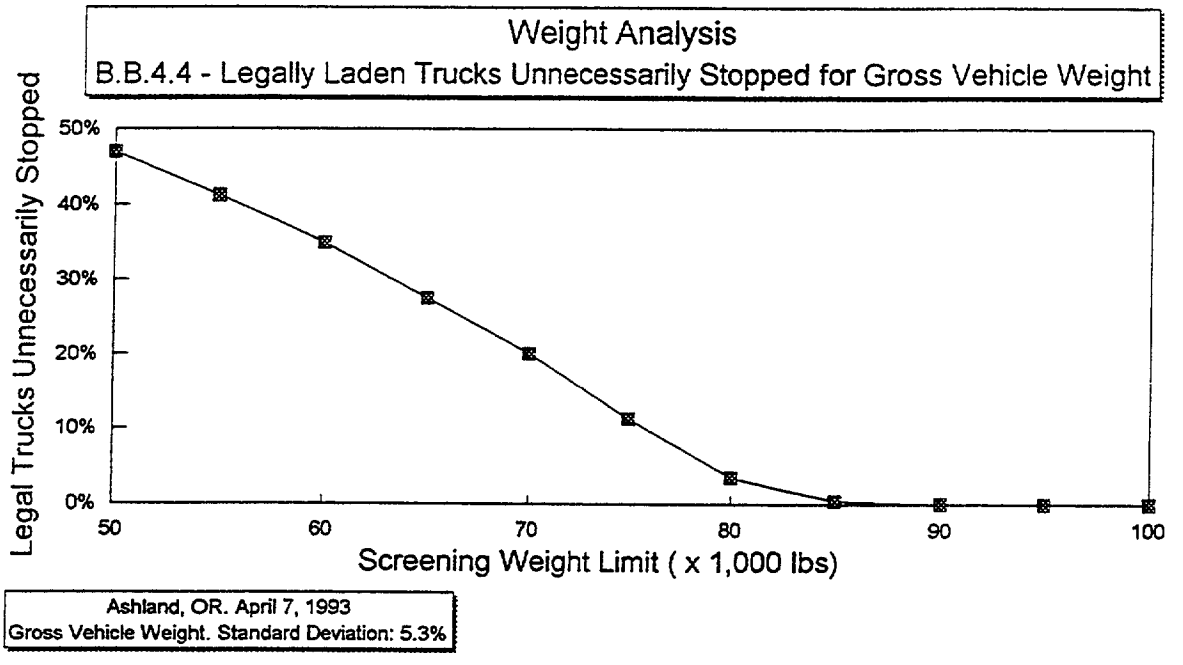

Weight Analysis
B.A.4.15 - Overweight Trucks Escaping Detection for Tandem Axle Loading
Overweight Trucks Escaping Detection
60%
40%
20%
0%
28
30
32
34
36
38
Screening Weight Limit (x 1,000 lbs)
Jefferson, OR. April 7, 1993
Tandem Axle Weight. Standard Deviation: 15.2%

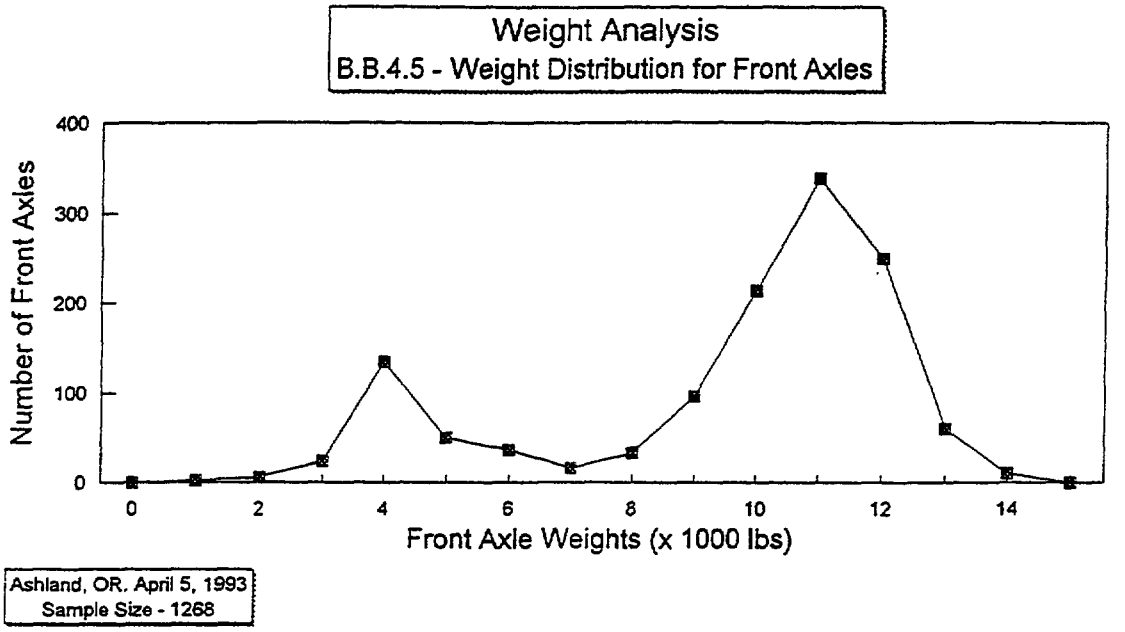

Weight Analysis
B.A.4.16 - Legally Laden Trucks Unnecessarily Stopped for Tandem Axle Loading
Legal Trucks Unnecessarily Stopped
25%
20%
15%
10%
5%
0%
28
30
32
34
36
38
Screening Weight Limit (x 1,000 lbs)
Jefferson, OR. April 7, 1993
Tandem Axle Weight. Standard Deviation: 15.2%

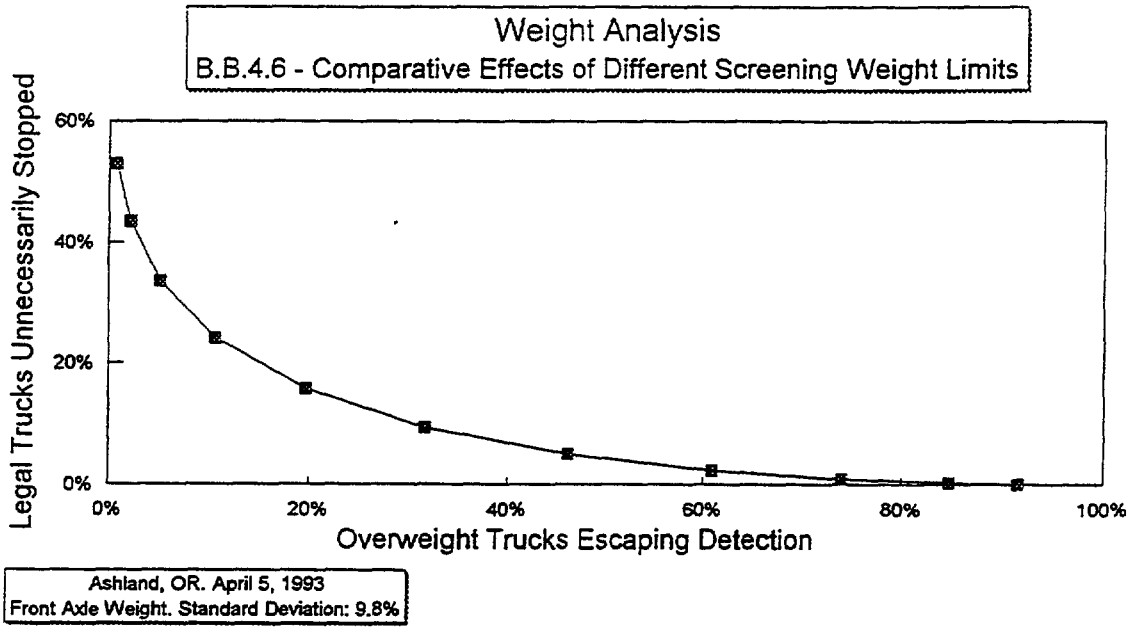

Weight Analysis
B.B.4.1 - Weight Distribution for Gross Vehicle Weights
Number of Trucks
0
10
20
30
40
0
10
20
30
40
50
60
70
80
90
Gross Truck Weights (x 1000 lbs)
Ashland, OR. April 5, 1993
Sample Size - 1268

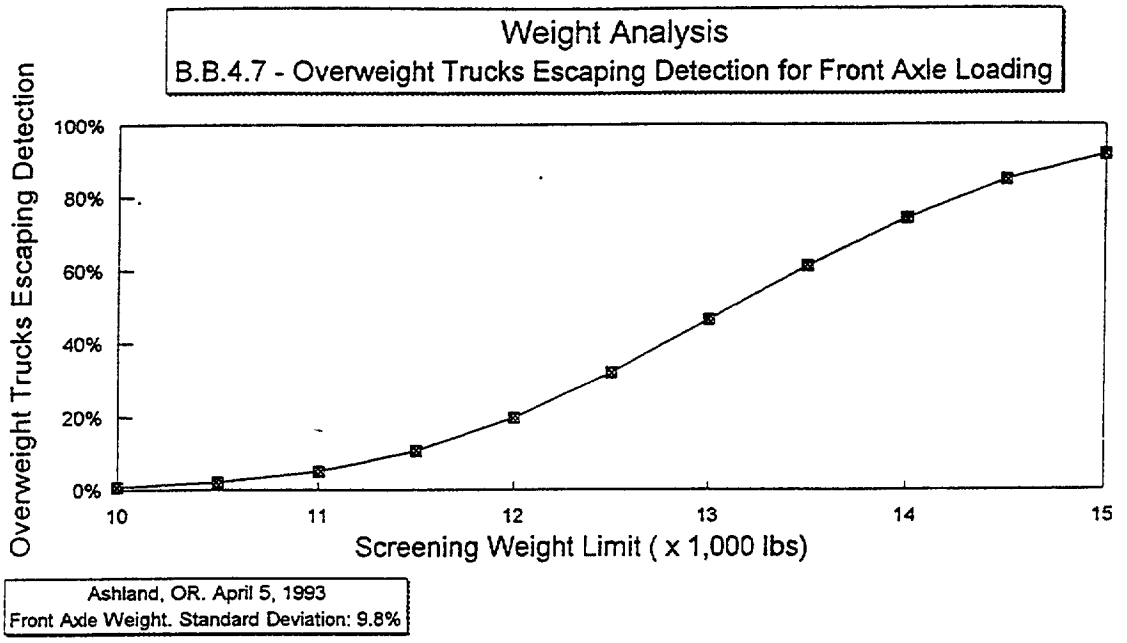

Weight Analysis
B.B.4.2 - Comparative Effects of Different Screening Weight Limits
Legal Trucks Unnecessarily Stopped
0%
10%
20%
30%
40%
50%
0%
20%
40%
60%
80%
100%
120%
Overweight Trucks Escaping Detection
Ashland, OR. April 5, 1993
Gross Vehicle Weight. Standard Deviation: 5.3%

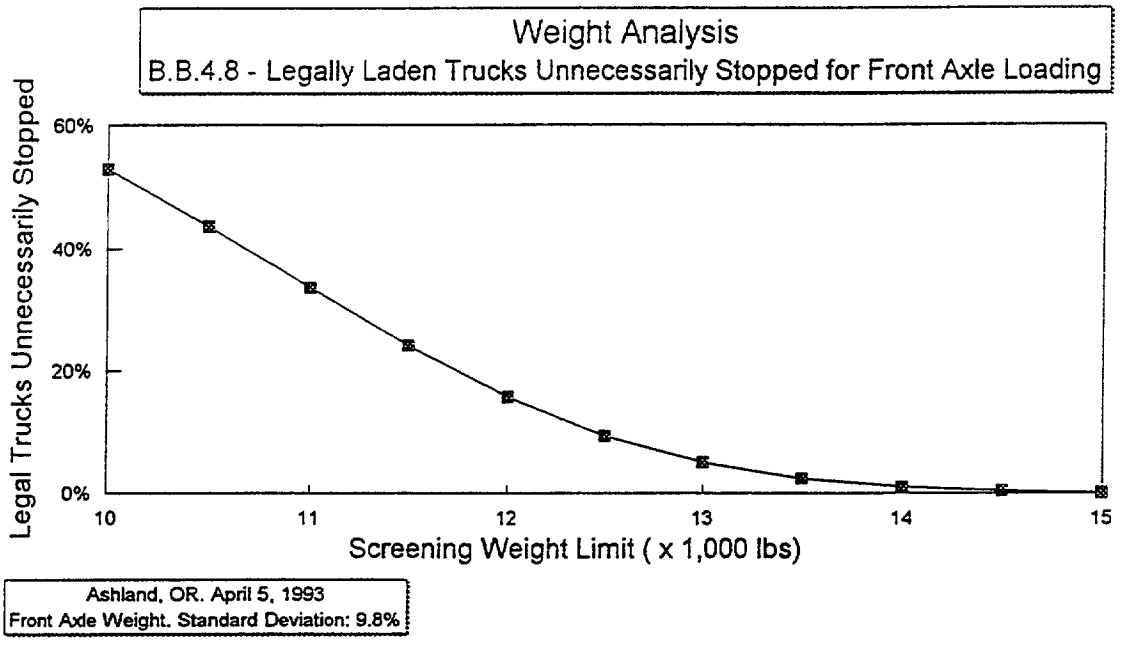

Weight Analysis
B.B.4.3 - Overweight Trucks Escaping Detection for Gross Vehicle Weight
Overweight Trucks Escaping Detection
120%
100%
80%
60%
40%
20%
0%
50
60
70
80
90
100
Screening Weight Limit (x 1,000 lbs)
Ashland, OR. April 5, 1993
Gross Vehicle Weight. Standard Deviation: 5.3%


Weight Analysis
B.B.4.4 - Legally Laden Trucks Unnecessarily Stopped for Gross Vehicle Weight
Legal Trucks Unnecessarily Stopped
50%
40%
30%
20%
10%
0%
50
60
70
80
90
100
Screening Weight Limit (x 1,000 lbs)
Ashland, OR. April 7, 1993
Gross Vehicle Weight. Standard Deviation: 5.3%

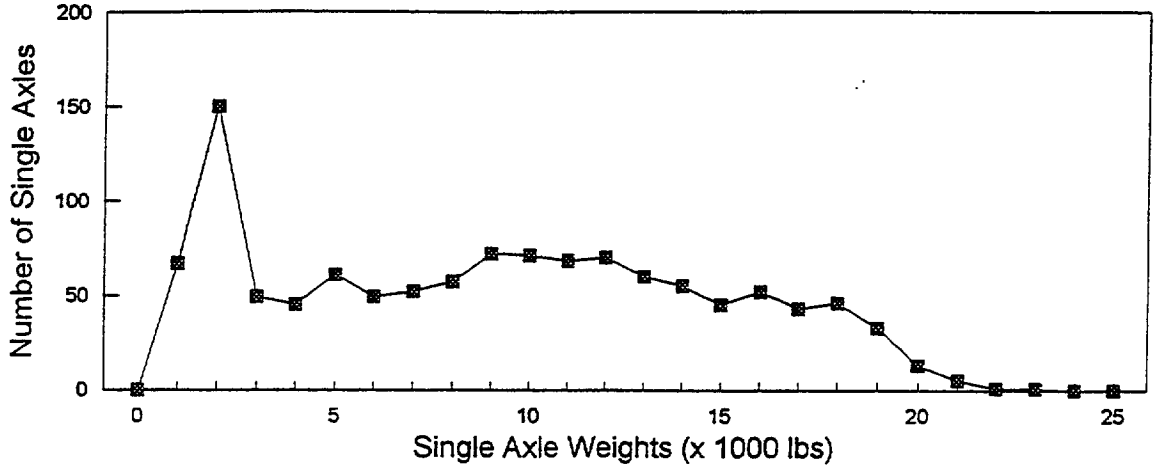

Weight Analysis
B.B.4.5 - Weight Distribution for Front Axles
Number of Front Axles
400
300
200
100
0
0
2
4
6
8
10
12
14
Front Axle Weights (x 1000 lbs)
Ashland, OR. April 5, 1993
Sample Size - 1268


Weight Analysis
B.B.4.6 - Comparative Effects of Different Screening Weight Limits
Legal Trucks Unnecessarily Stopped
60%
40%
20%
0%
0%
20%
40%
60%
80%
100%
Overweight Trucks Escaping Detection
Ashland, OR. April 5, 1993
Front Axle Weight. Standard Deviation: 9.8%


Weight Analysis
B.B.4.7 - Overweight Trucks Escaping Detection for Front Axle Loading
Overweight Trucks Escaping Detection
100%
80%
60%
40%
20%
0%
10
11
12
13
14
15
Screening Weight Limit (x 1,000 lbs)
Ashland, OR. April 5, 1993
Front Axle Weight. Standard Deviation: 9.8%

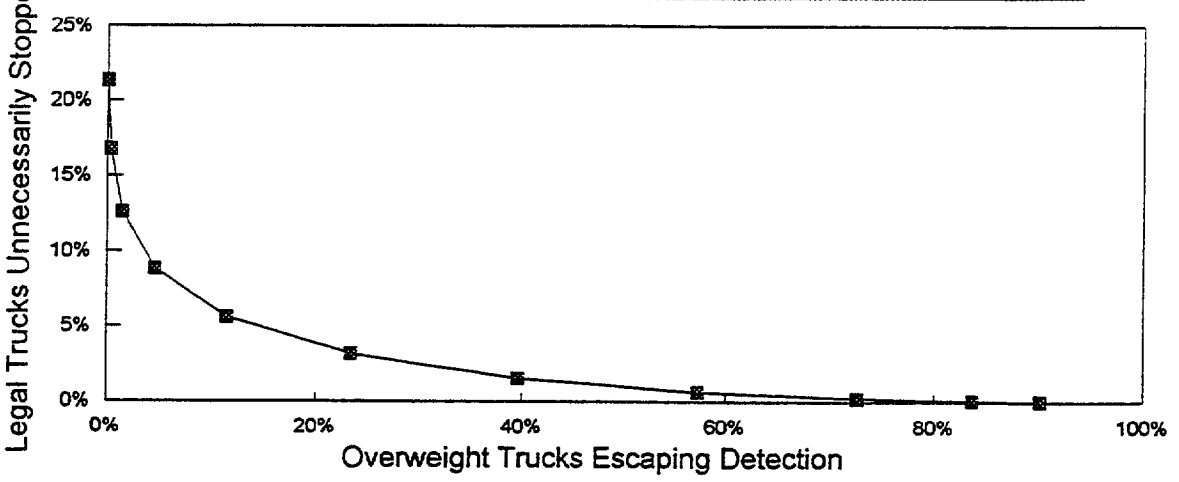

Weight Analysis
B.B.4.8 - Legally Laden Trucks Unnecessarily Stopped for Front Axle Loading
Legal Trucks Unnecessarily Stopped
60%
40%
20%
0%
10
11
12
13
14
15
Screening Weight Limit (x 1,000 lbs)
Ashland, OR. April 5, 1993
Front Axle Weight. Standard Deviation: 9.8%

Weight Analysis
B.B.4.9 - Weight Distribution for Single Axles

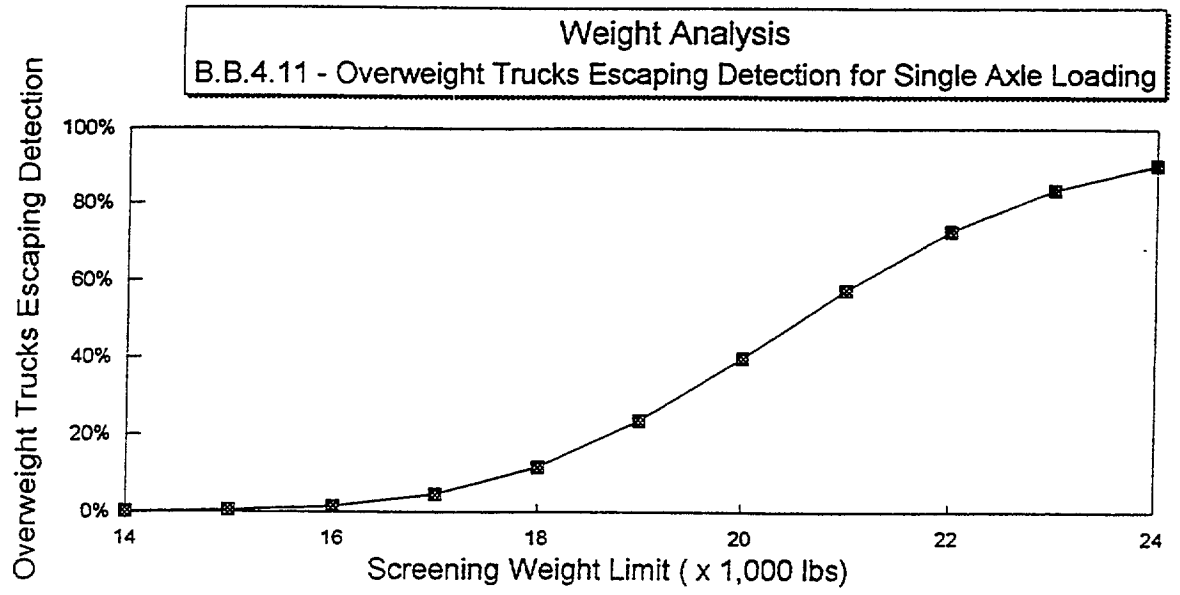


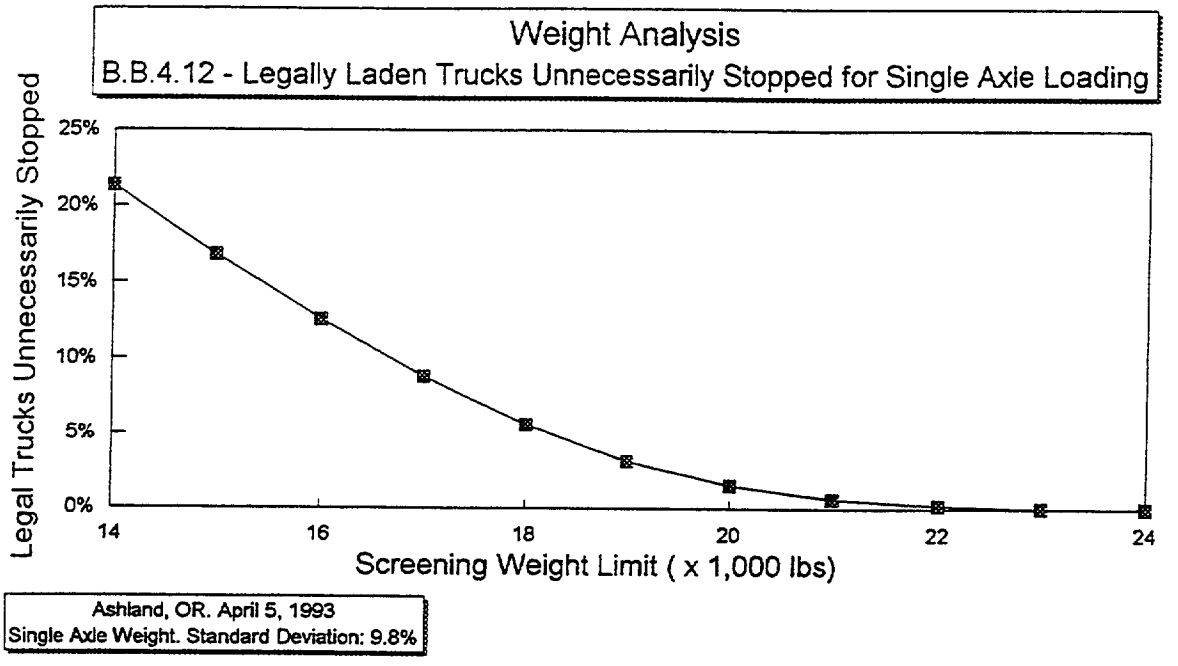
Ashland, OR. April 5, 1993
Sample Size - 1166

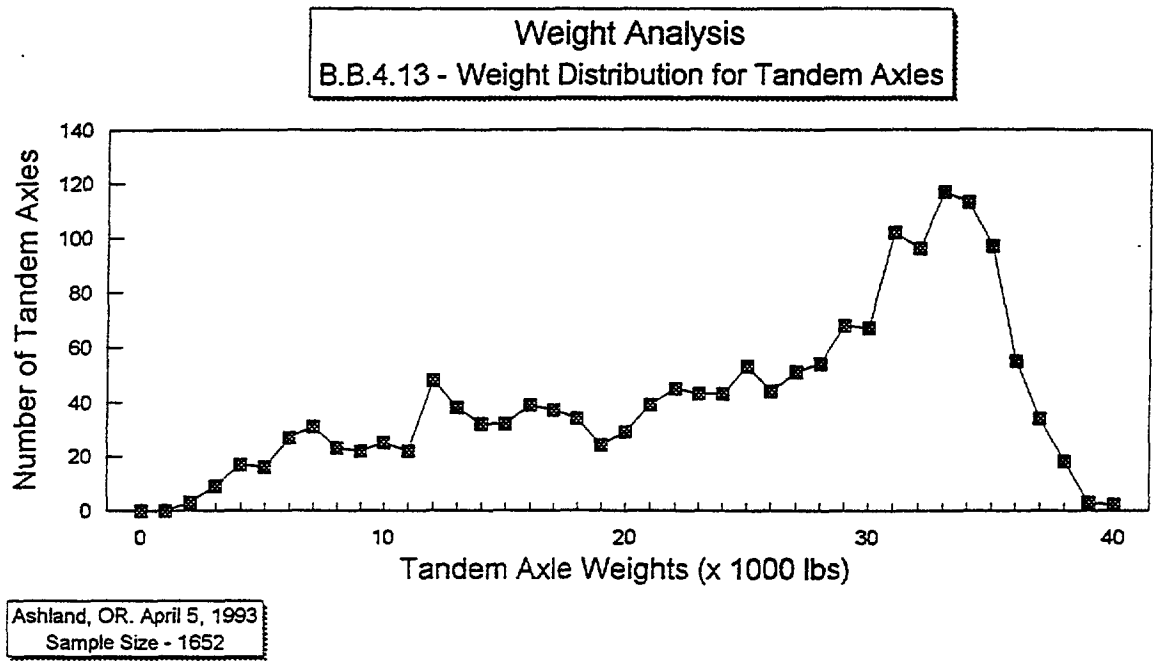
Weight Analysis
B.B.4.10 - Comparative Effects of Different Screening Weight Limits

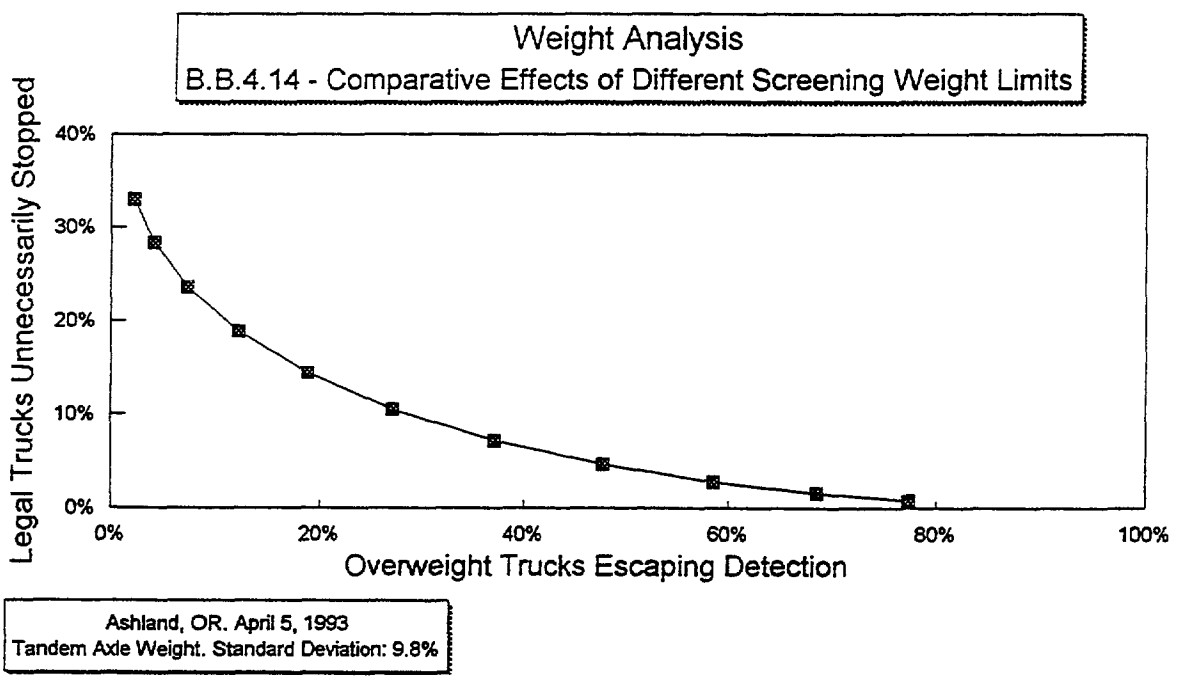


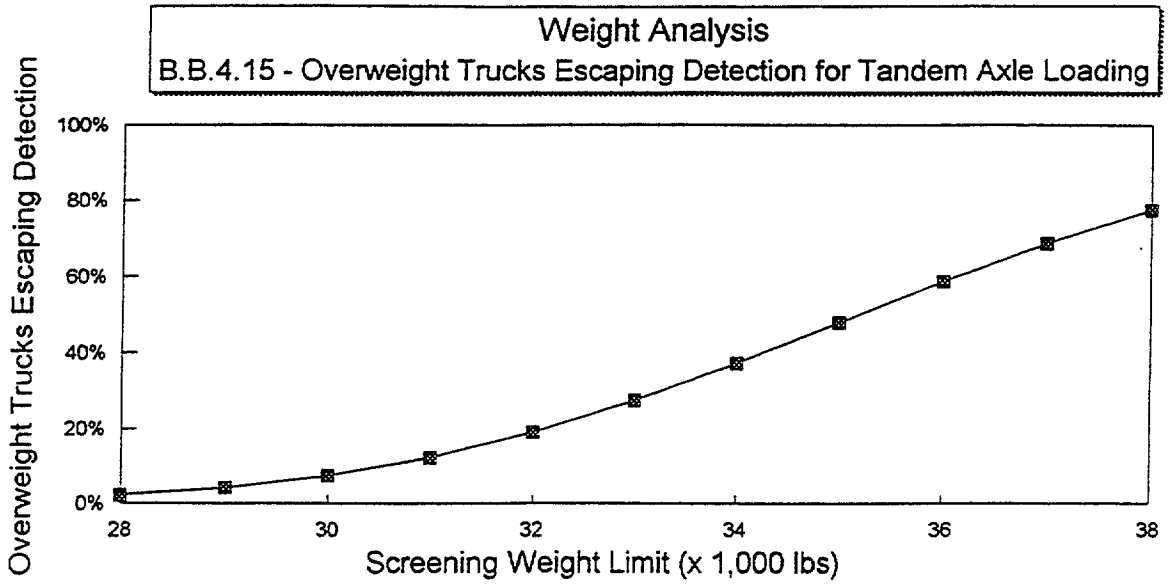
Ashland, OR. April 5, 1993
Single Axle Weight. Standard Deviation: 9.8%

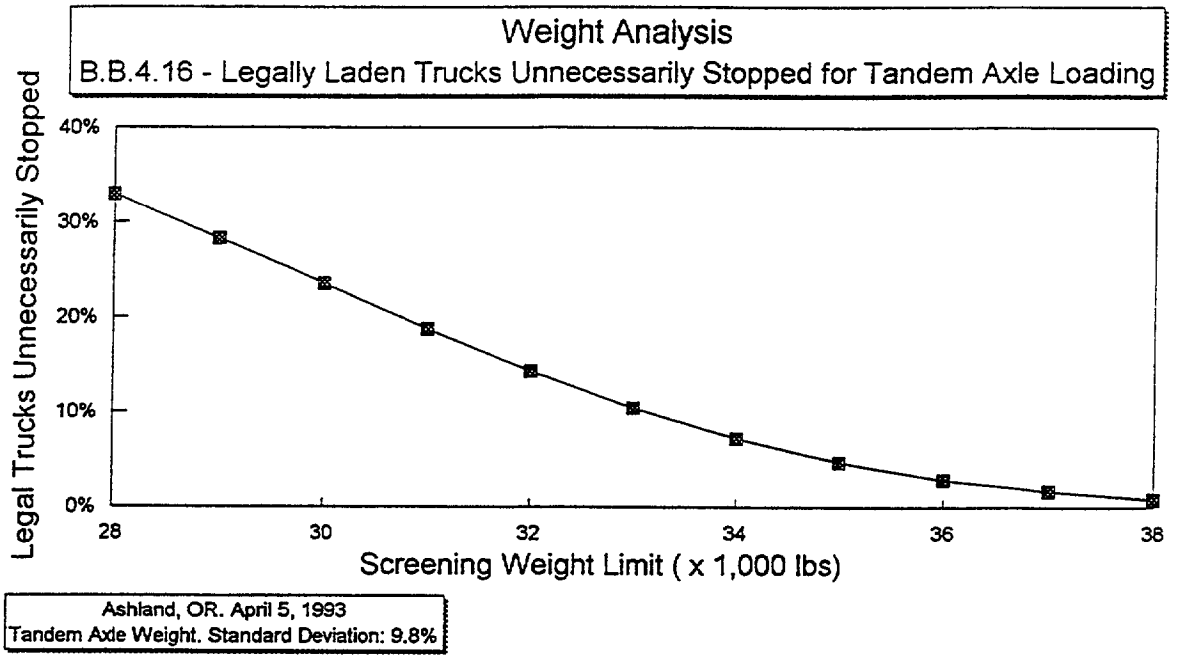

Weight Analysis
B.B.4.11 - Overweight Trucks Escaping Detection for Single Axle Loading
Overweight Trucks Escaping Detection
100%
80%
60%
40%
20%
0%
14
16
18
20
22
24
Screening Weight Limit (x 1,000 lbs)
Ashland, OR. April 5, 1993
Single Axle Weight. Standard Deviation: 9.8%

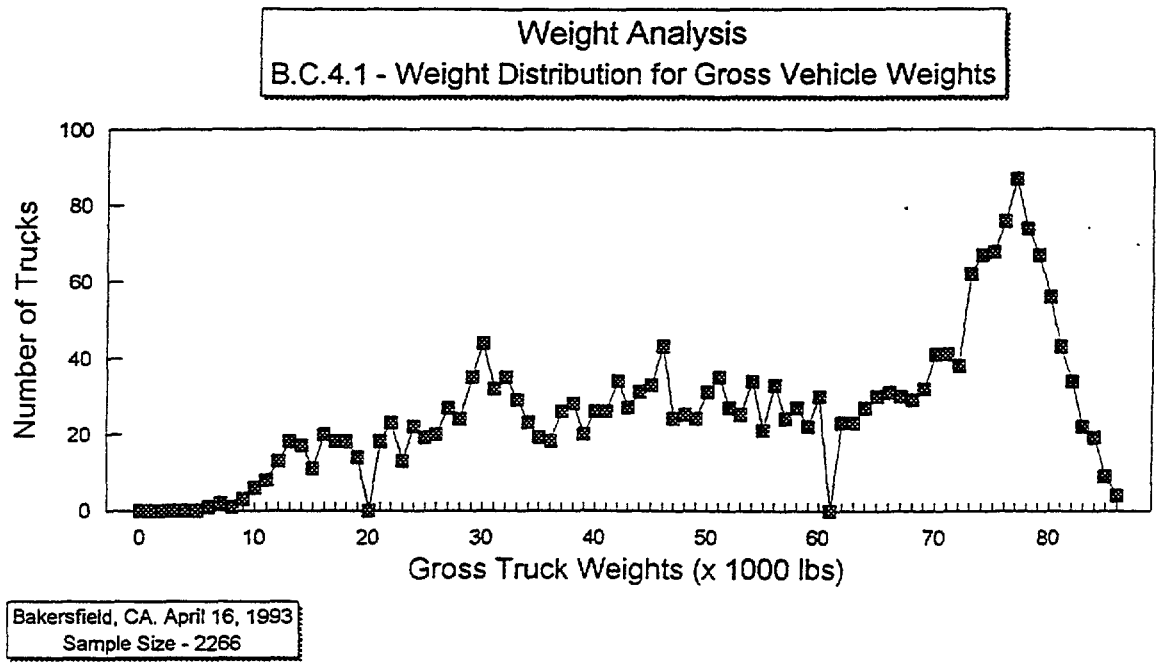

Weight Analysis
B.B.4.12 - Legally Laden Trucks Unnecessarily Stopped for Single Axle Loading
Legal Trucks Unnecessarily Stopped
25%
20%
15%
10%
5%
0%
14
16
18
20
22
24
Screening Weight Limit (x 1,000 lbs)
Ashland, OR. April 5, 1993
Single Axle Weight. Standard Deviation: 9.8%

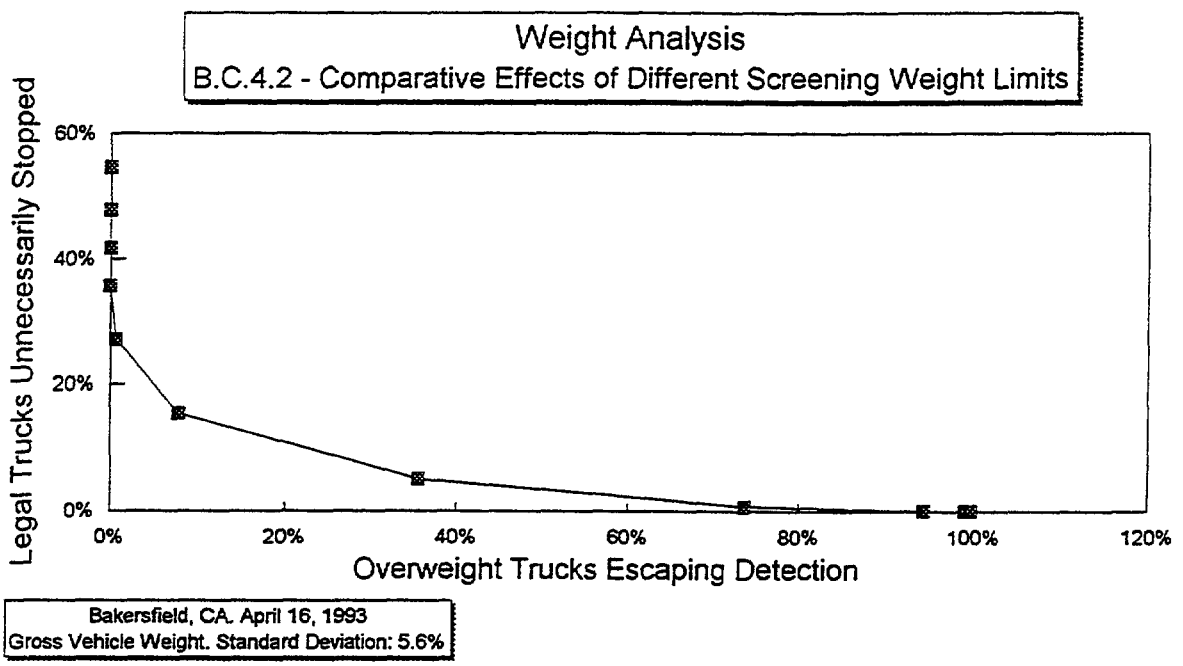

Weight Analysis
B.B.4.13 - Weight Distribution for Tandem Axles
Number of Tandem Axles
140
120
100
80
60
40
20
0
0
10
20
30
40
Tandem Axle Weights (x 1000 lbs)
Ashland, OR. April 5, 1993
Sample Size - 1652

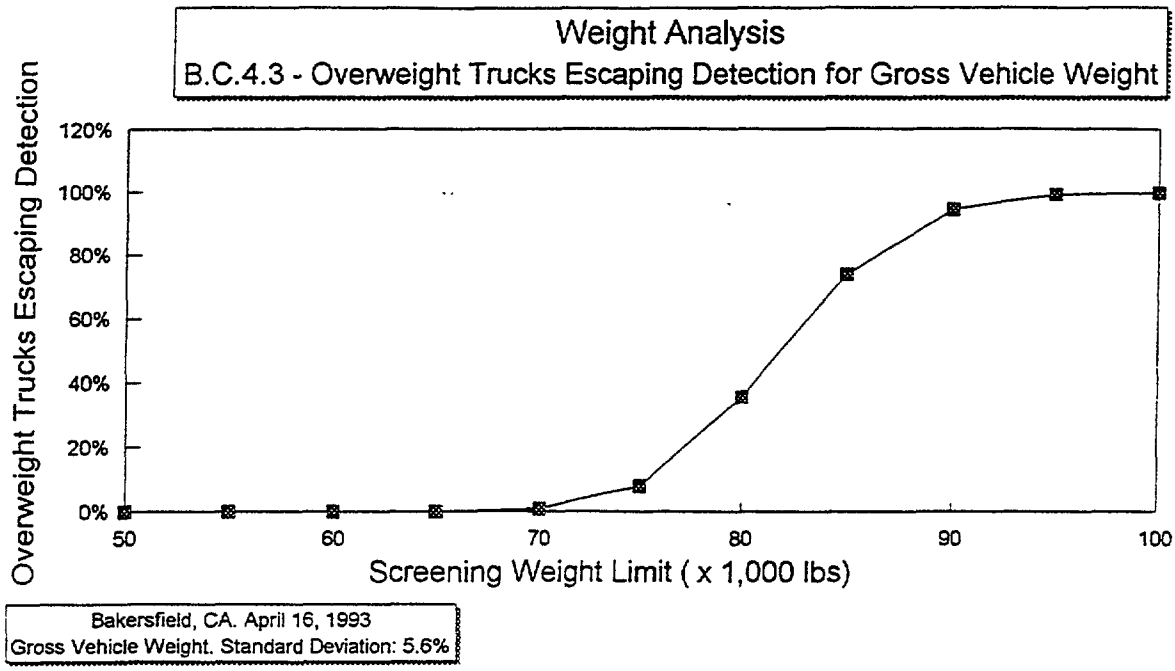

Weight Analysis
B.B.4.14 - Comparative Effects of Different Screening Weight Limits
Legal Trucks Unnecessarily Stopped
40%
30%
20%
10%
0%
0%
20%
40%
60%
80%
100%
Overweight Trucks Escaping Detection
Ashland, OR. April 5, 1993
Tandem Axle Weight. Standard Deviation: 9.8%

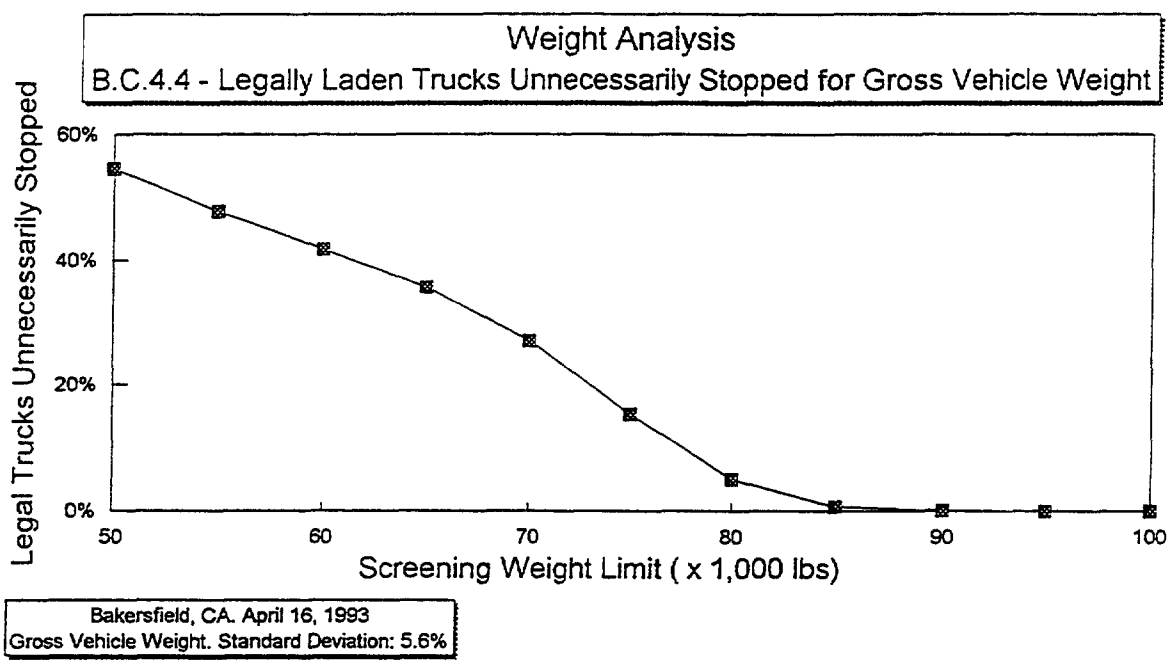

Weight Analysis
B.B.4.15 - Overweight Trucks Escaping Detection for Tandem Axle Loading
Overweight Trucks Escaping Detection
100%
80%
60%
40%
20%
0%
28
30
32
34
36
38
Screening Weight Limit (x 1,000 lbs)
Ashland, OR. April 5, 1993
Tandem Axle Weight. Standard Deviation: 9.8%

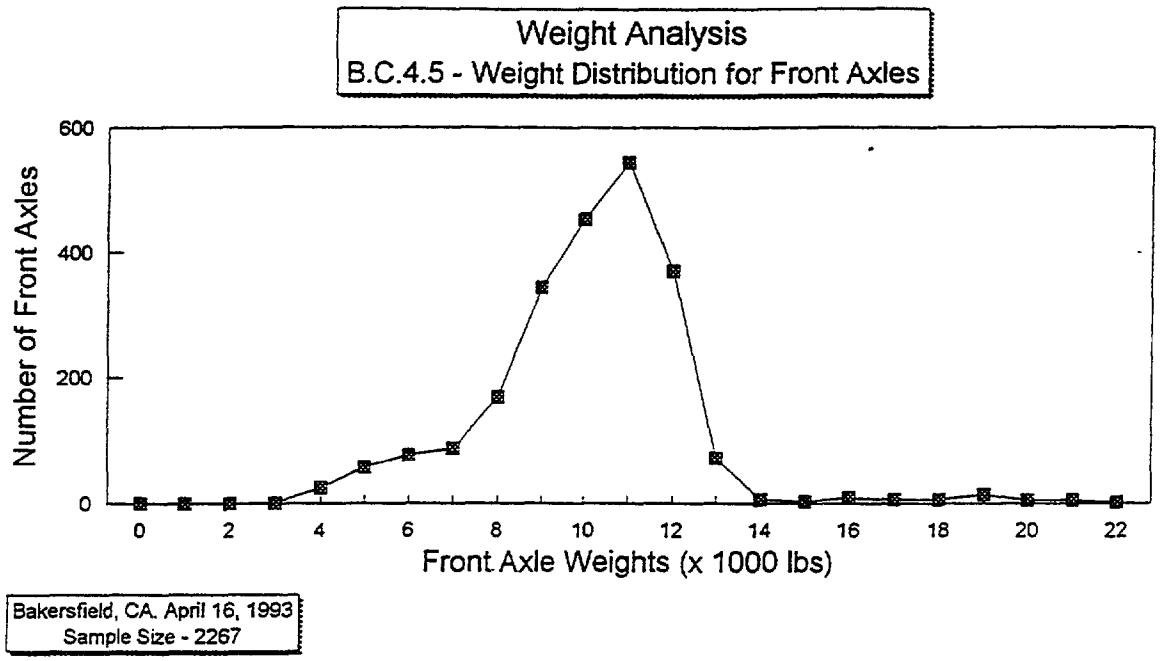

Weight Analysis
B.B.4.16 - Legally Laden Trucks Unnecessarily Stopped for Tandem Axle Loading
Legal Trucks Unnecessarily Stopped
40%
30%
20%
10%
0%
28
30
32
34
36
38
Screening Weight Limit (x 1,000 lbs)
Ashland, OR. April 5, 1993
Tandem Axle Weight. Standard Deviation: 9.8%

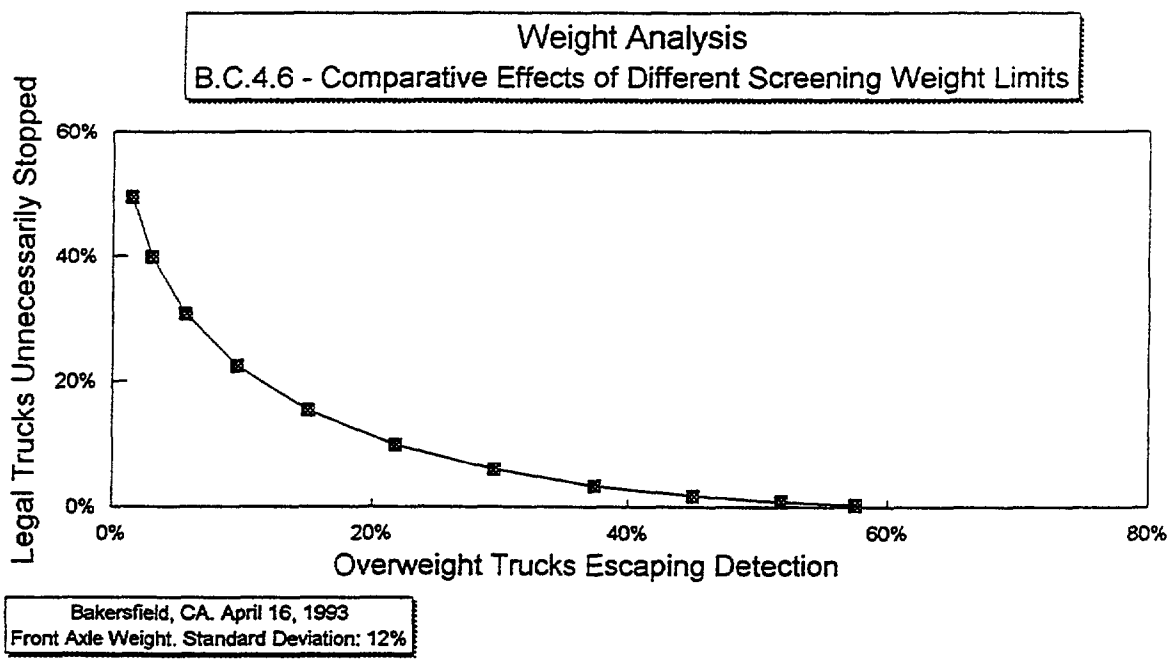

Weight Analysis
B.C.4.1 - Weight Distribution for Gross Vehicle Weights
Number of Trucks
100
80
60
40
20
0
0
10
20
30
40
50
60
70
80
Gross Truck Weights (x 1000 lbs)
Bakersfield, CA. April 16, 1993
Sample Size - 2266

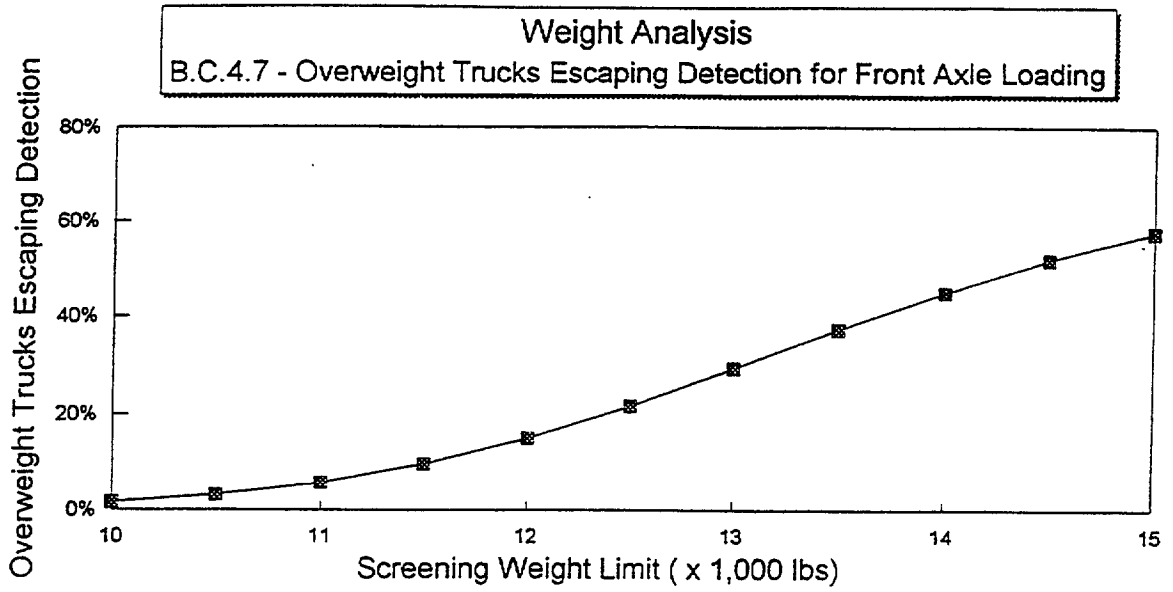

Weight Analysis
B.C.4.2 - Comparative Effects of Different Screening Weight Limits
Legal Trucks Unnecessarily Stopped
60%
40%
20%
0%
0%
20%
40%
60%
80%
100%
120%
Overweight Trucks Escaping Detection
Bakersfield, CA. April 16, 1993
Gross Vehicle Weight. Standard Deviation: 5.6%

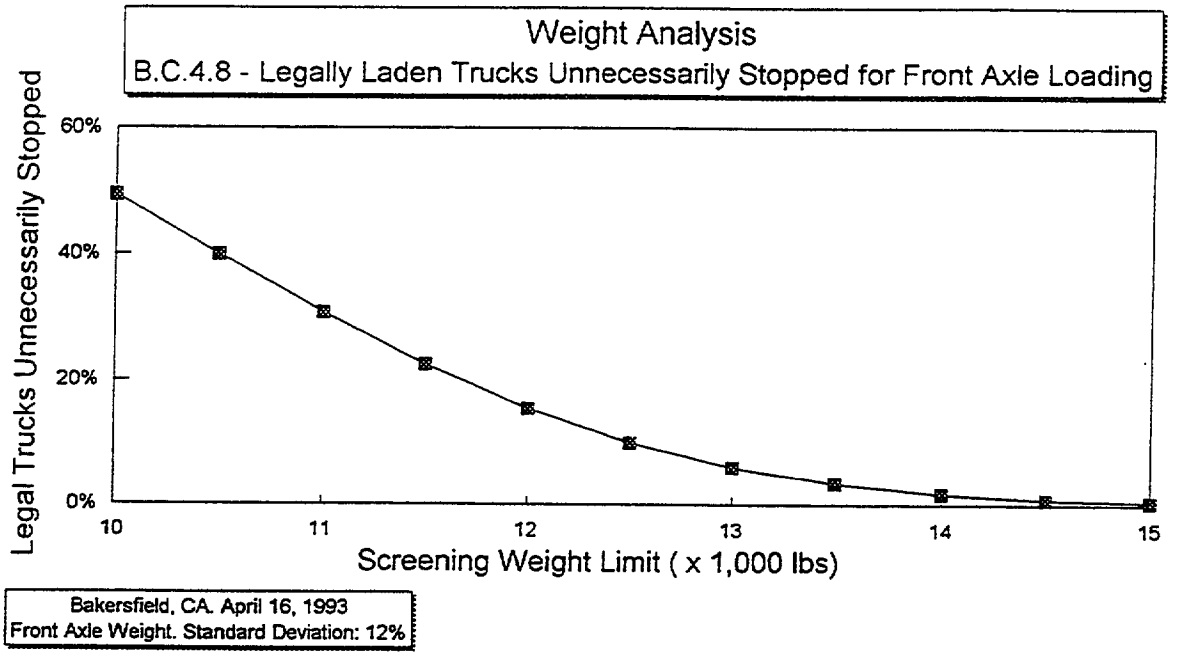

Weight Analysis
B.C.4.3 - Overweight Trucks Escaping Detection for Gross Vehicle Weight
Overweight Trucks Escaping Detection
120%
100%
80%
60%
40%
20%
0%
50
60
70
80
90
100
Screening Weight Limit (x 1,000 lbs)
Bakersfield, CA. April 16, 1993
Gross Vehicle Weight. Standard Deviation: 5.6%

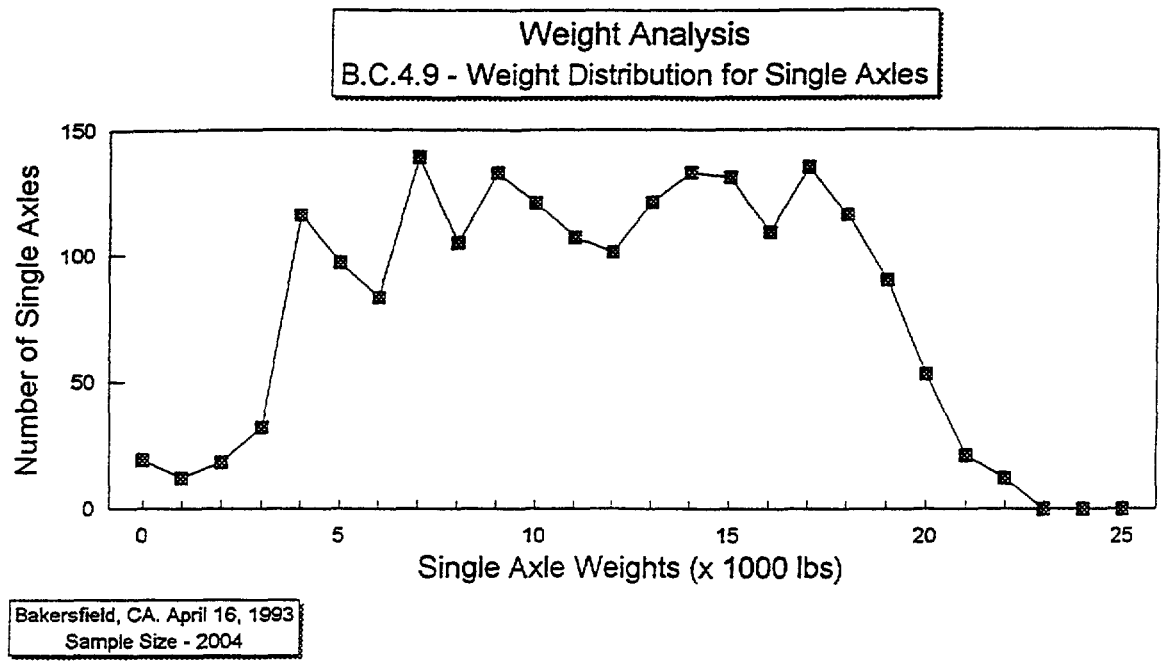

Weight Analysis
B.C.4.4 - Legally Laden Trucks Unnecessarily Stopped for Gross Vehicle Weight
Legal Trucks Unnecessarily Stopped
60%
40%
20%
0%
50
60
70
80
90
100
Screening Weight Limit (x 1,000 lbs)
Bakersfield, CA. April 16, 1993
Gross Vehicle Weight. Standard Deviation: 5.6%

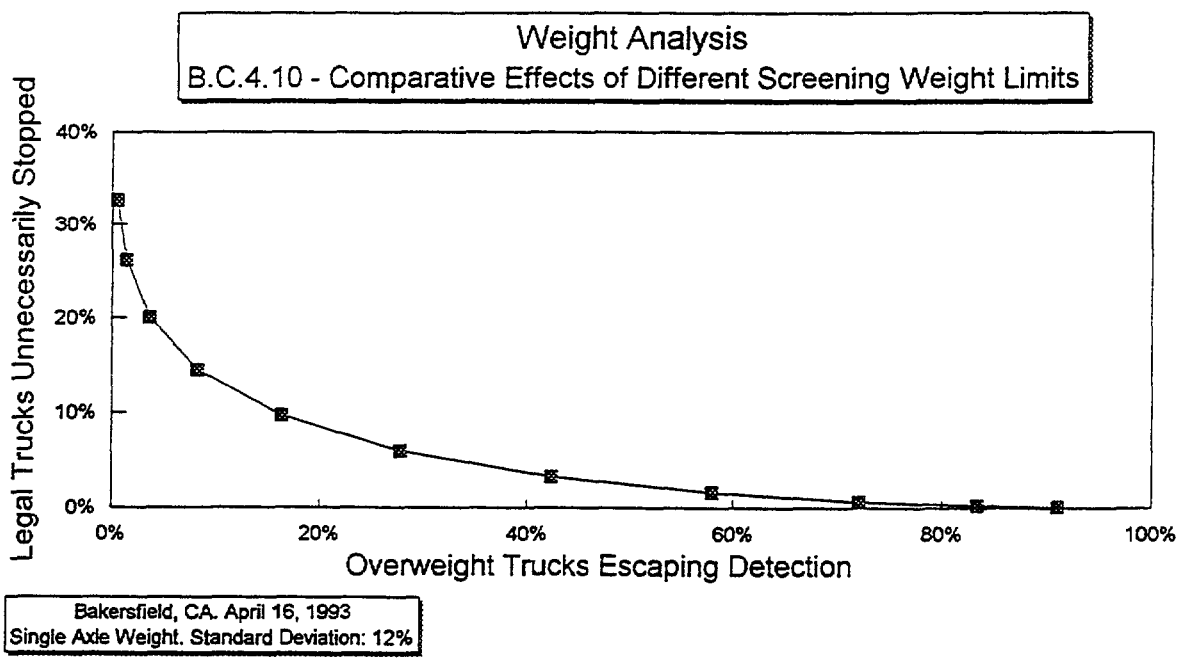

Weight Analysis
B.C.4.5 - Weight Distribution for Front Axles
Number of Front Axles
600
400
200
0
0
2
4
6
8
10
12
14
16
18
20
22
Front Axle Weights (x 1000 lbs)
Bakersfield, CA. April 16, 1993
Sample Size - 2267

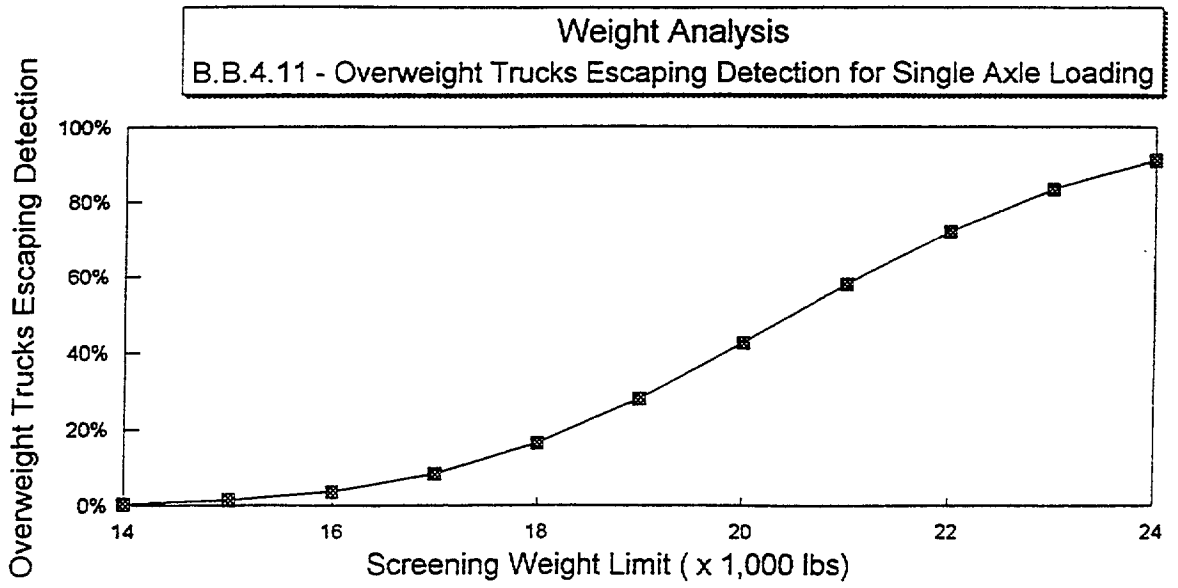

Weight Analysis
B.C.4.6 - Comparative Effects of Different Screening Weight Limits
Legal Trucks Unnecessarily Stopped
60%
40%
20%
0%
0%
20%
40%
60%
80%
Overweight Trucks Escaping Detection
Bakersfield, CA. April 16, 1993
Front Axle Weight. Standard Deviation: 12%

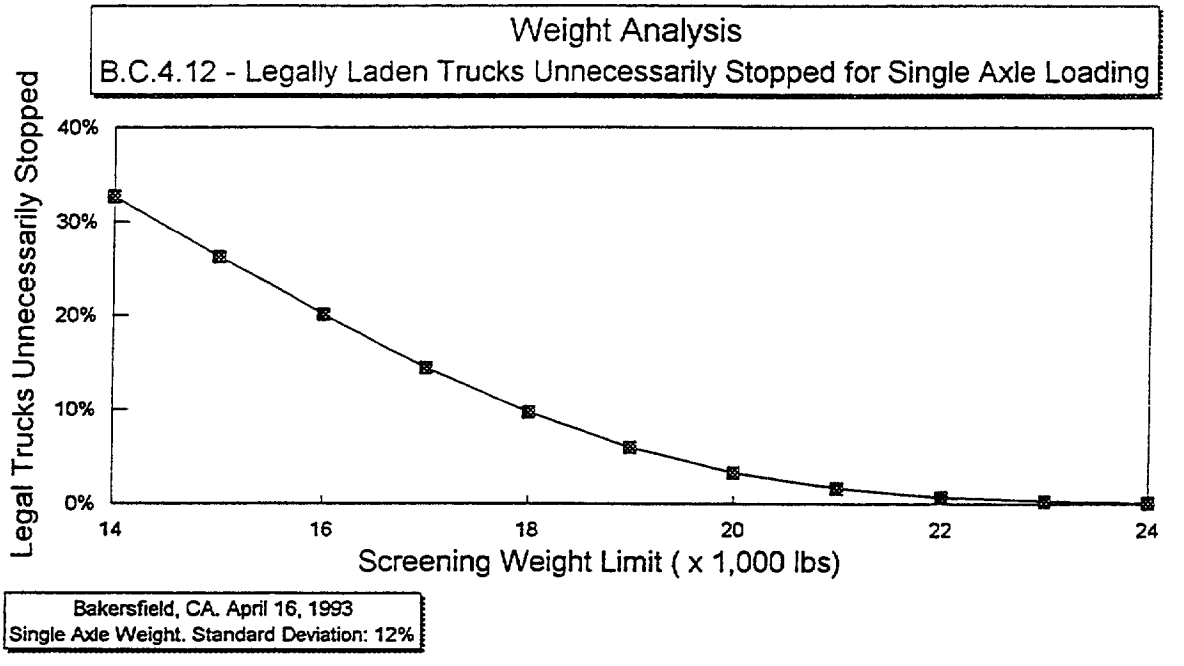

Weight Analysis
B.C.4.7 - Overweight Trucks Escaping Detection for Front Axle Loading
Overweight Trucks Escaping Detection
80%
60%
40%
20%
0%
10
11
12
13
14
15
Screening Weight Limit (x 1,000 lbs)
Bakersfield, CA. April 16, 1993
Front Axle Weight. Standard Deviation: 12%

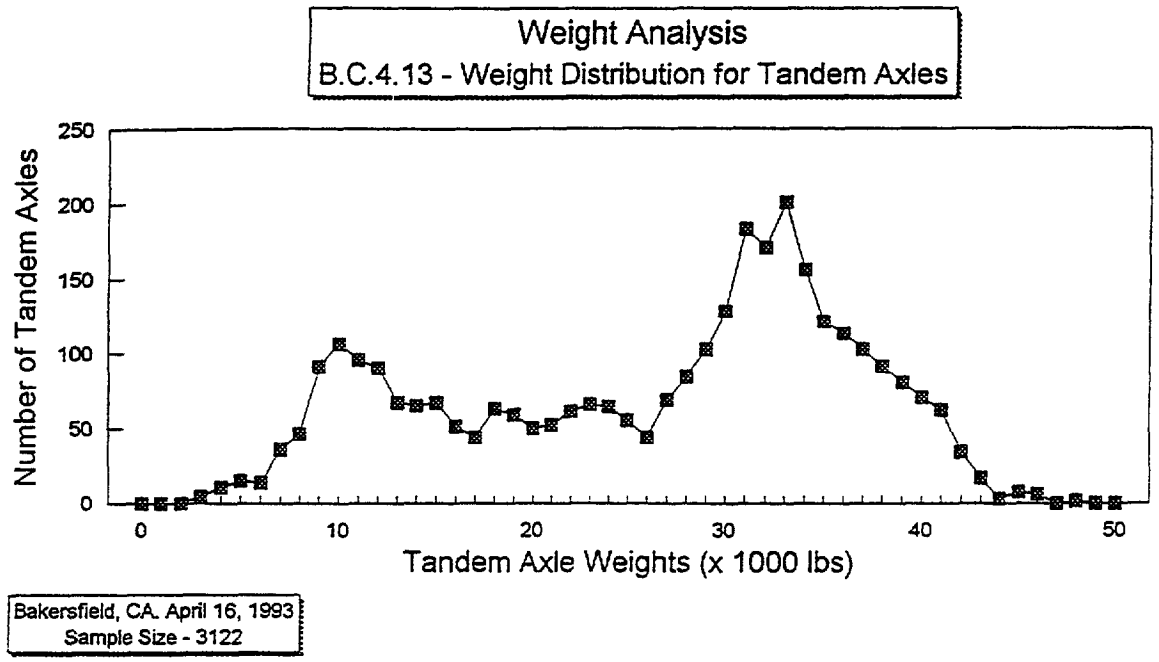

Weight Analysis
B.C.4.8 - Legally Laden Trucks Unnecessarily Stopped for Front Axle Loading
Legal Trucks Unnecessarily Stopped
60%
40%
20%
0%
10
11
12
13
14
15
Screening Weight Limit (x 1,000 lbs)
Bakersfield, CA. April 16, 1993
Front Axle Weight. Standard Deviation: 12%

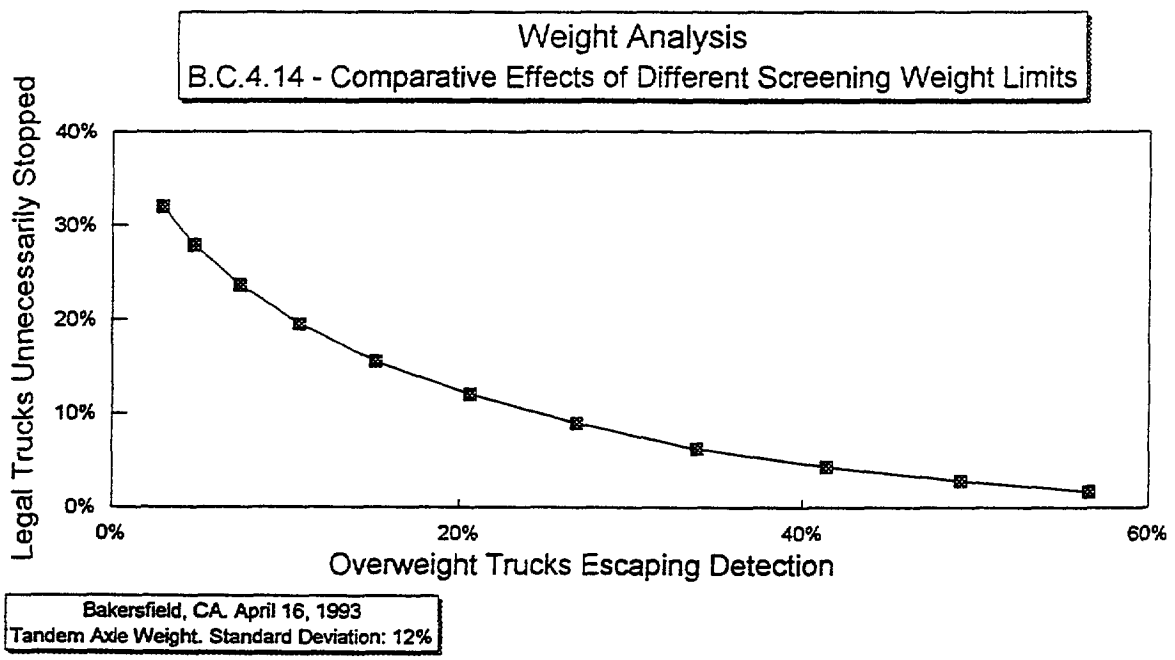

Weight Analysis
B.C.4.9 - Weight Distribution for Single Axles
Number of Single Axles
150
100
50
0
0
5
10
15
20
25
Single Axle Weights (x 1000 lbs)
Bakersfield, CA. April 16, 1993
Sample Size - 2004

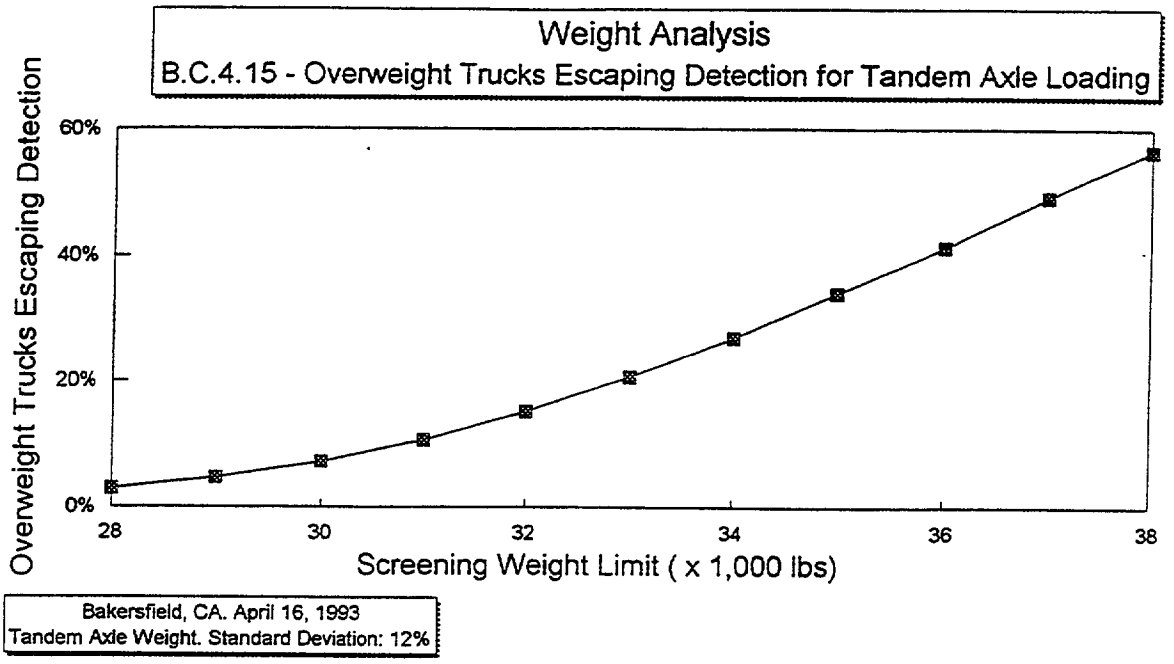

Weight Analysis
B.C.4.10 - Comparative Effects of Different Screening Weight Limits
Legal Trucks Unnecessarily Stopped
40%
30%
20%
10%
0%
0%
20%
40%
60%
80%
100%
Overweight Trucks Escaping Detection
Bakersfield, CA. April 16, 1993
Single Axle Weight. Standard Deviation: 12%

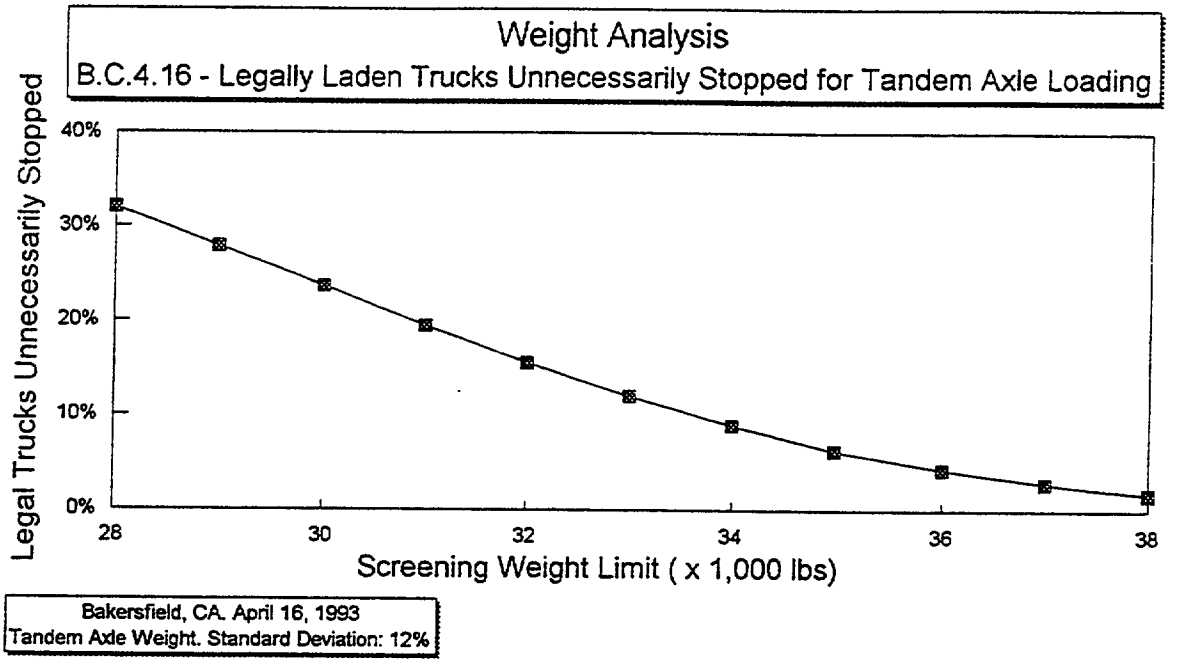

Weight Analysis
B.B.4.11 - Overweight Trucks Escaping Detection for Single Axle Loading
Overweight Trucks Escaping Detection
100%
80%
60%
40%
20%
0%
14
16
18
20
22
24
Screening Weight Limit (x 1,000 lbs)
Bakersfield, CA. April 16, 1993
Single Axle Weight. Standard Deviation: 12%

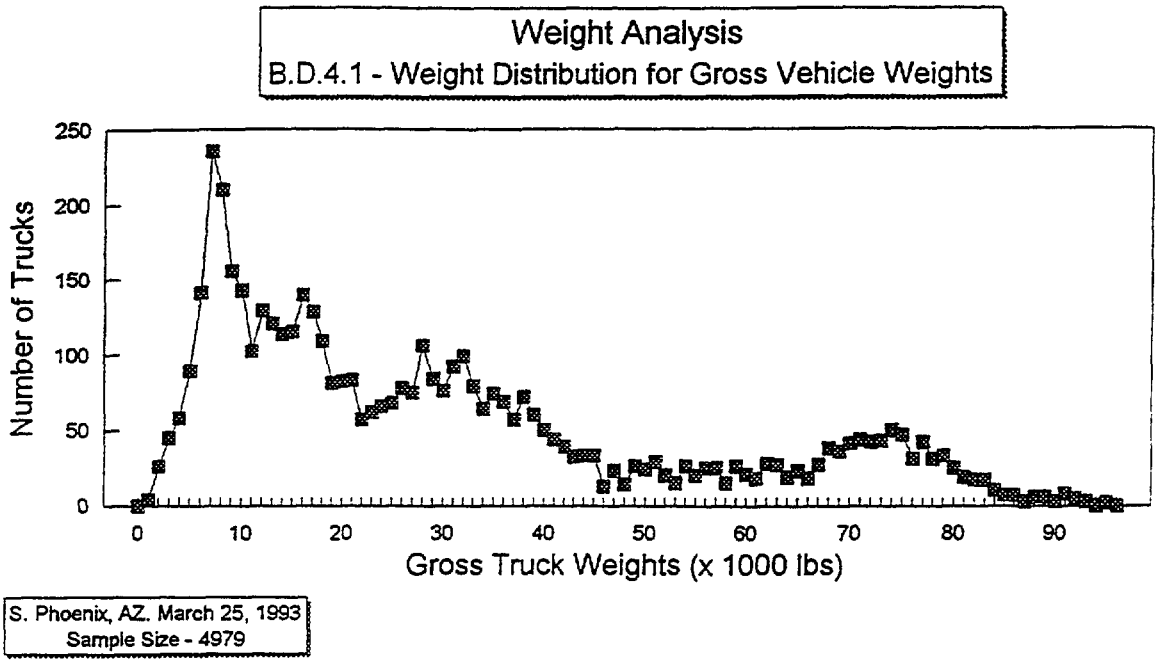

Weight Analysis
B.C.4.12 - Legally Laden Trucks Unnecessarily Stopped for Single Axle Loading
Legal Trucks Unnecessarily Stopped
40%
30%
20%
10%
0%
14
16
18
20
22
24
Screening Weight Limit (x 1,000 lbs)
Bakersfield, CA. April 16, 1993
Single Axle Weight. Standard Deviation: 12%

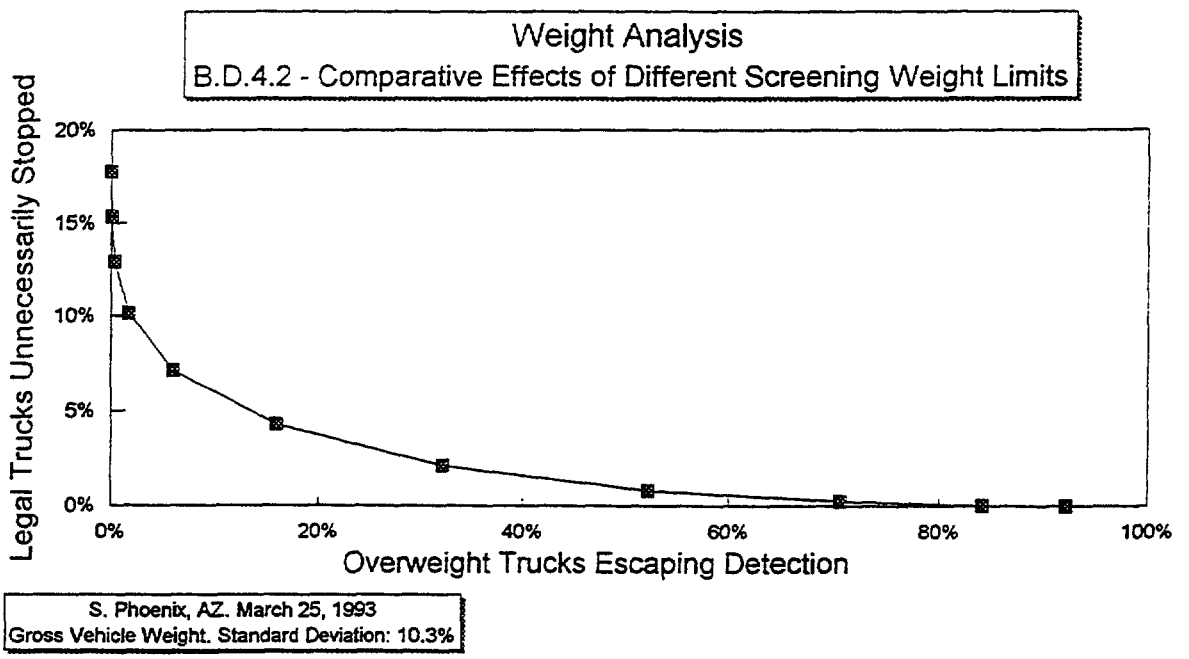

Weight Analysis
B.C.4.13 - Weight Distribution for Tandem Axles
Number of Tandem Axles
250
200
150
100
50
0
0
10
20
30
40
50
Tandem Axle Weights (x 1000 lbs)
Bakersfield, CA. April 16, 1993
Sample Size - 3122

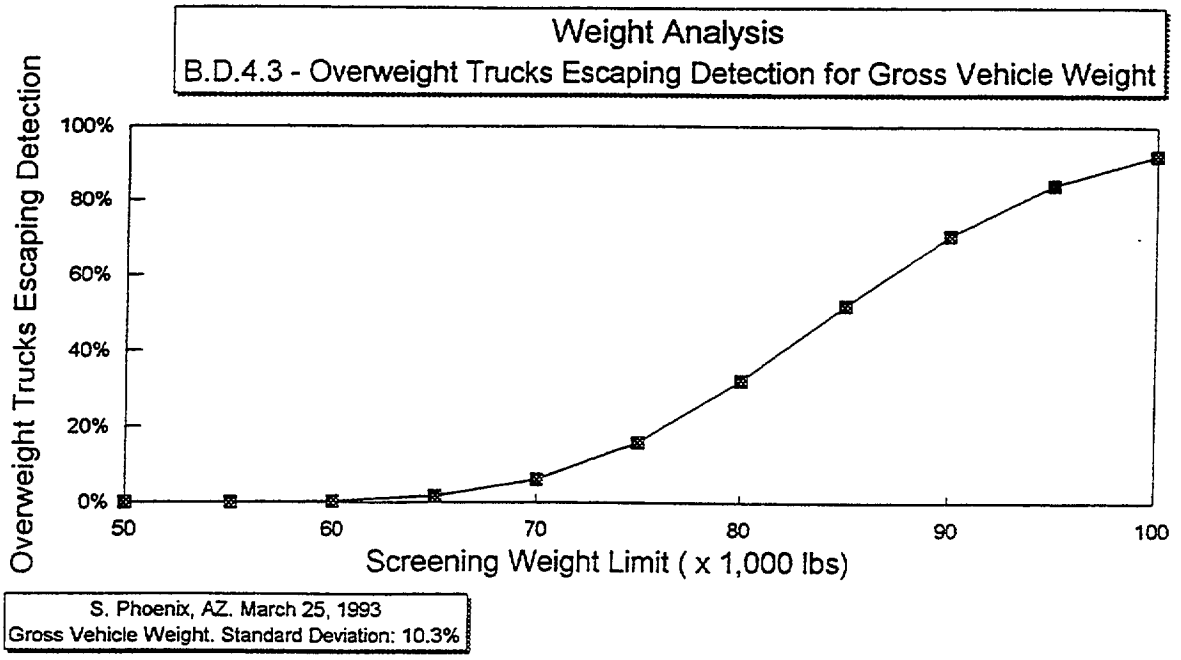

Weight Analysis
B.C.4.14 - Comparative Effects of Different Screening Weight Limits
Legal Trucks Unnecessarily Stopped
40%
30%
20%
10%
0%
0%
20%
40%
60%
Overweight Trucks Escaping Detection
Bakersfield, CA. April 16, 1993
Tandem Axle Weight. Standard Deviation: 12%

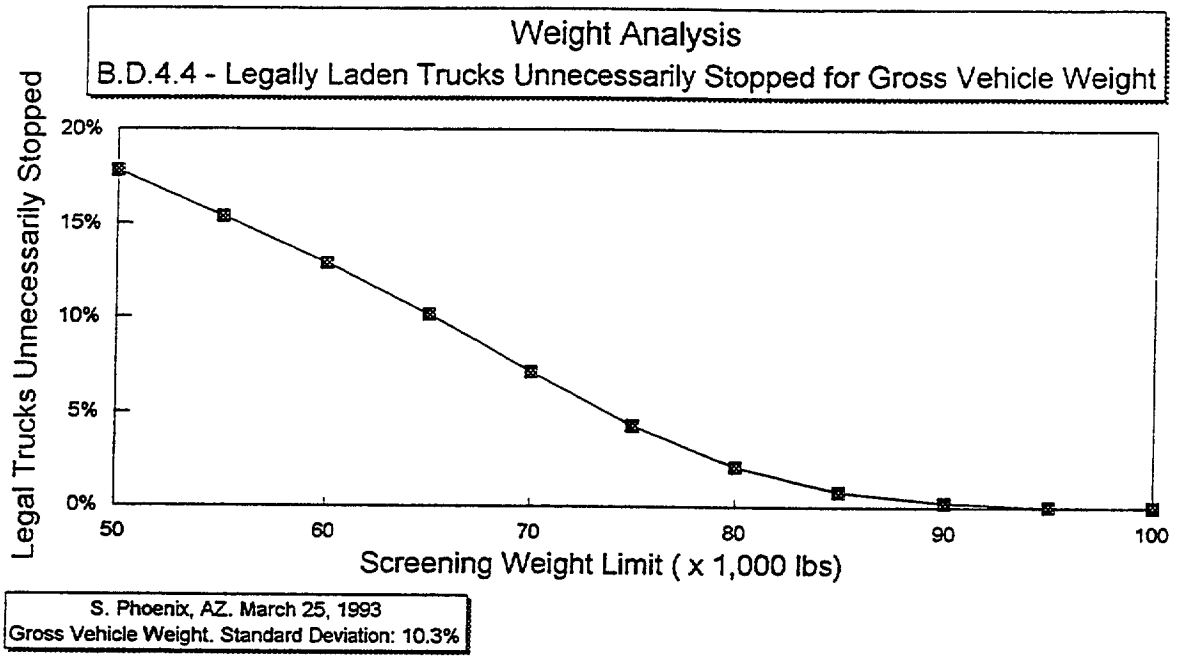

Weight Analysis
B.C.4.15 - Overweight Trucks Escaping Detection for Tandem Axle Loading
Overweight Trucks Escaping Detection
60%
40%
20%
0%
28
30
32
34
36
38
Screening Weight Limit (x 1,000 lbs)
Bakersfield, CA. April 16, 1993
Tandem Axle Weight. Standard Deviation: 12%

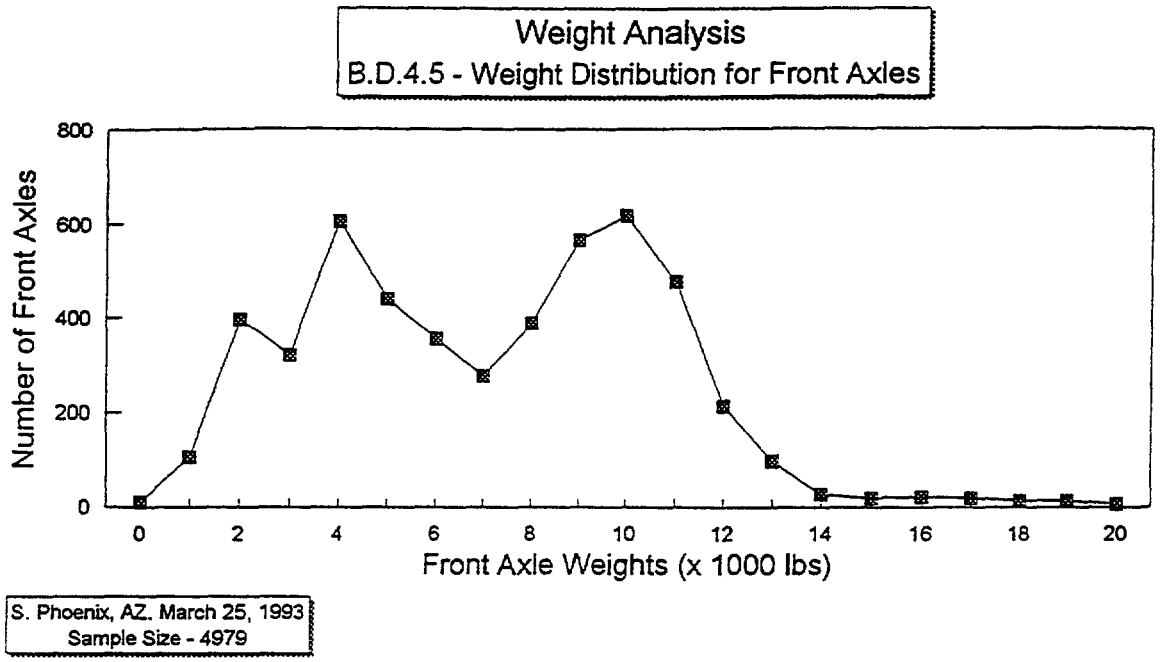

Weight Analysis
B.C.4.16 - Legally Laden Trucks Unnecessarily Stopped for Tandem Axle Loading
Legal Trucks Unnecessarily Stopped
40%
30%
20%
10%
0%
28
30
32
34
36
38
Screening Weight Limit (x 1,000 lbs)
Bakersfield, CA. April 16, 1993
Tandem Axle Weight. Standard Deviation: 12%

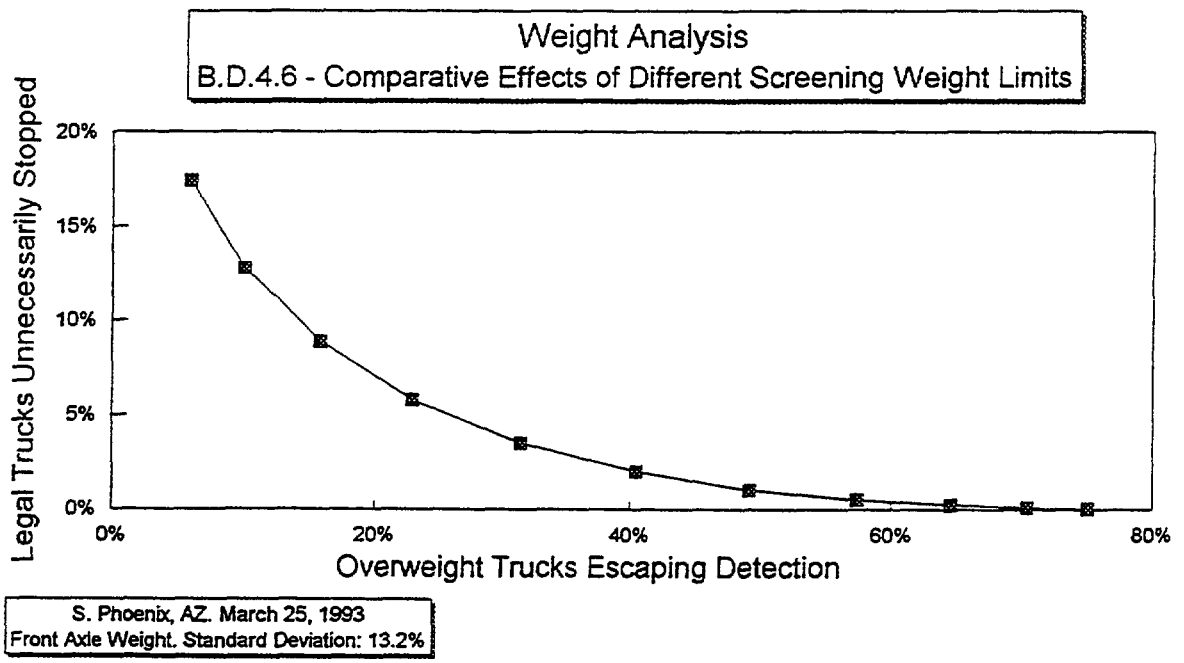

Weight Analysis
B.D.4.1 - Weight Distribution for Gross Vehicle Weights
Number of Trucks
250
200
150
100
50
0
0
10
20
30
40
50
60
70
80
90
Gross Truck Weights (x 1000 lbs)
S. Phoenix, AZ. March 25, 1993
Sample Size - 4979

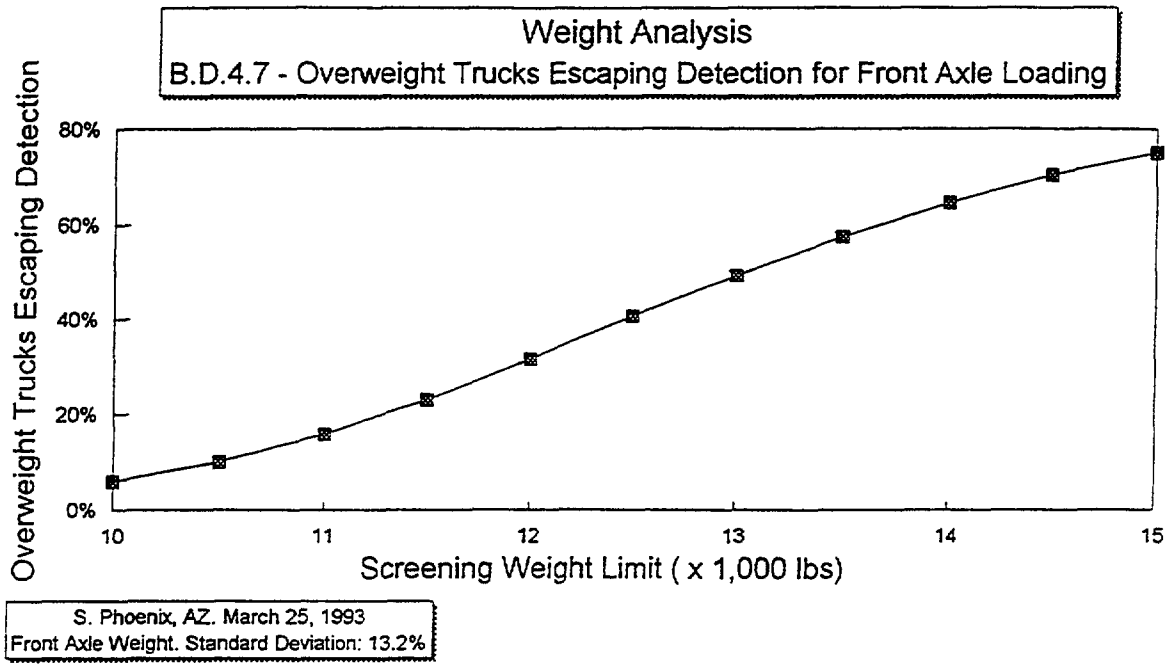

Weight Analysis
B.D.4.2 - Comparative Effects of Different Screening Weight Limits
Legal Trucks Unnecessarily Stopped
20%
15%
10%
5%
0%
0%
20%
40%
60%
80%
100%
Overweight Trucks Escaping Detection
S. Phoenix, AZ. March 25, 1993
Gross Vehicle Weight. Standard Deviation: 10.3%

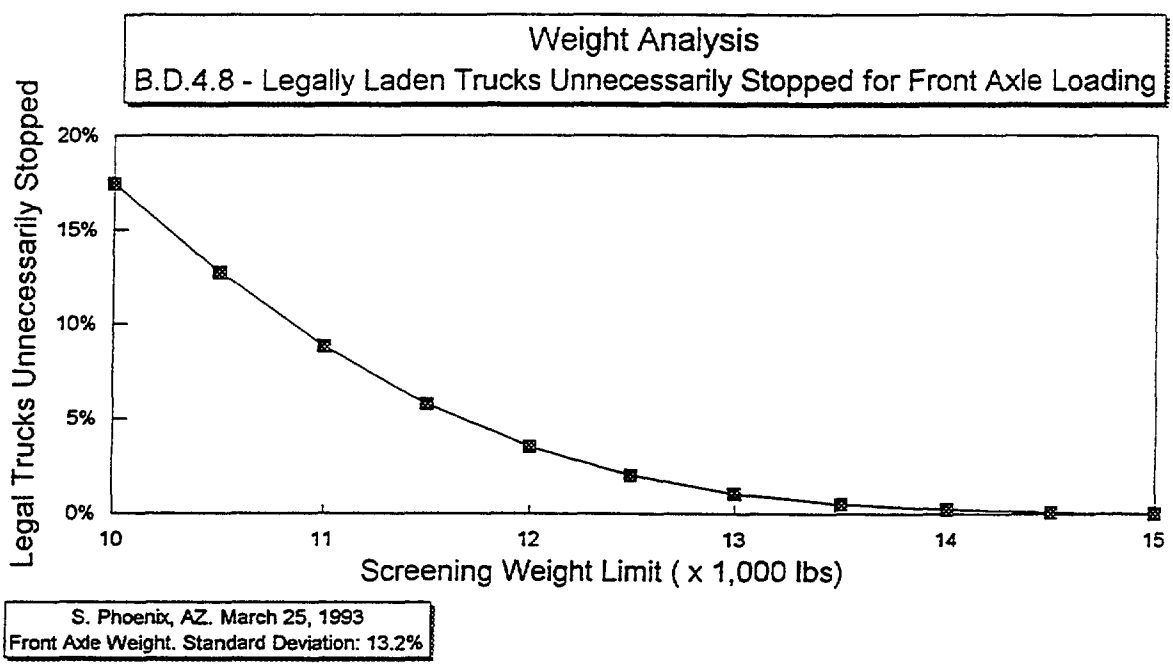

Weight Analysis
B.D.4.3 - Overweight Trucks Escaping Detection for Gross Vehicle Weight
Overweight Trucks Escaping Detection
100%
80%
60%
40%
20%
0%
50
60
70
80
90
100
Screening Weight Limit (x 1,000 lbs)
S. Phoenix, AZ. March 25, 1993
Gross Vehicle Weight. Standard Deviation: 10.3%

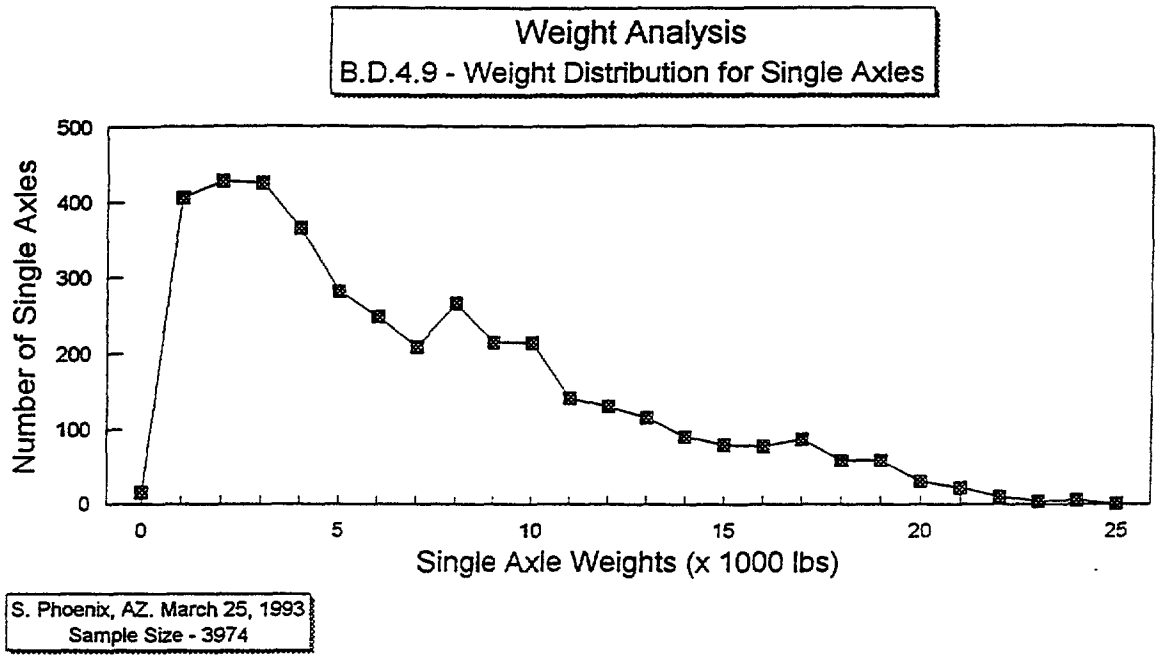

Weight Analysis
B.D.4.4 - Legally Laden Trucks Unnecessarily Stopped for Gross Vehicle Weight
Legal Trucks Unnecessarily Stopped
20%
15%
10%
5%
0%
50
60
70
80
90
100
Screening Weight Limit (x 1,000 lbs)
S. Phoenix, AZ. March 25, 1993
Gross Vehicle Weight. Standard Deviation: 10.3%

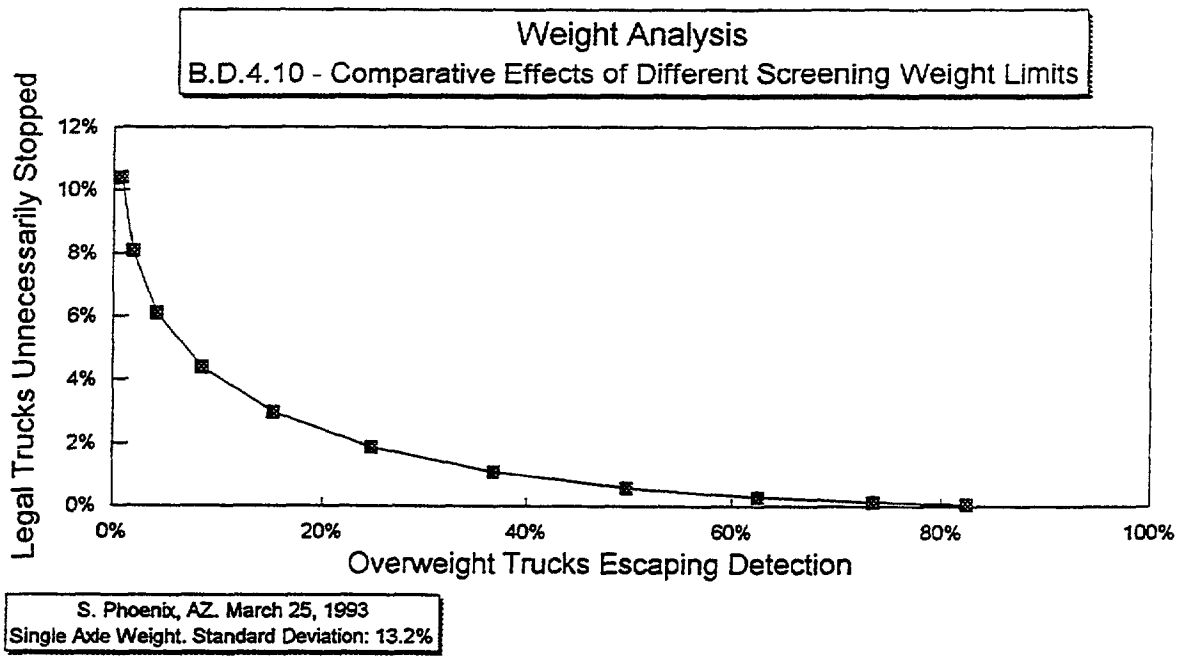

Weight Analysis
B.D.4.5 - Weight Distribution for Front Axles
Number of Front Axles
800
600
400
200
0
0
2
4
6
8
10
12
14
16
18
20
Front Axle Weights (x 1000 lbs)
S. Phoenix, AZ. March 25, 1993
Sample Size - 4979

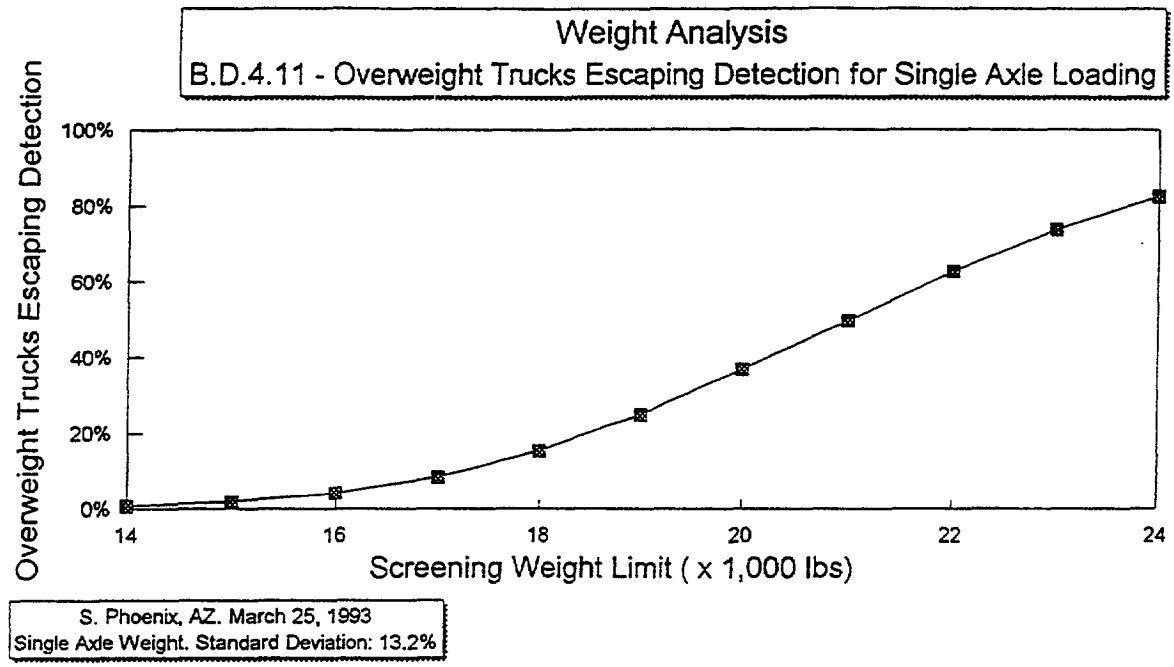

Weight Analysis
B.D.4.6 - Comparative Effects of Different Screening Weight Limits
Legal Trucks Unnecessarily Stopped
20%
15%
10%
5%
0%
0%
20%
40%
60%
80%
Overweight Trucks Escaping Detection
S. Phoenix, AZ. March 25, 1993
Front Axle Weight. Standard Deviation: 13.2%

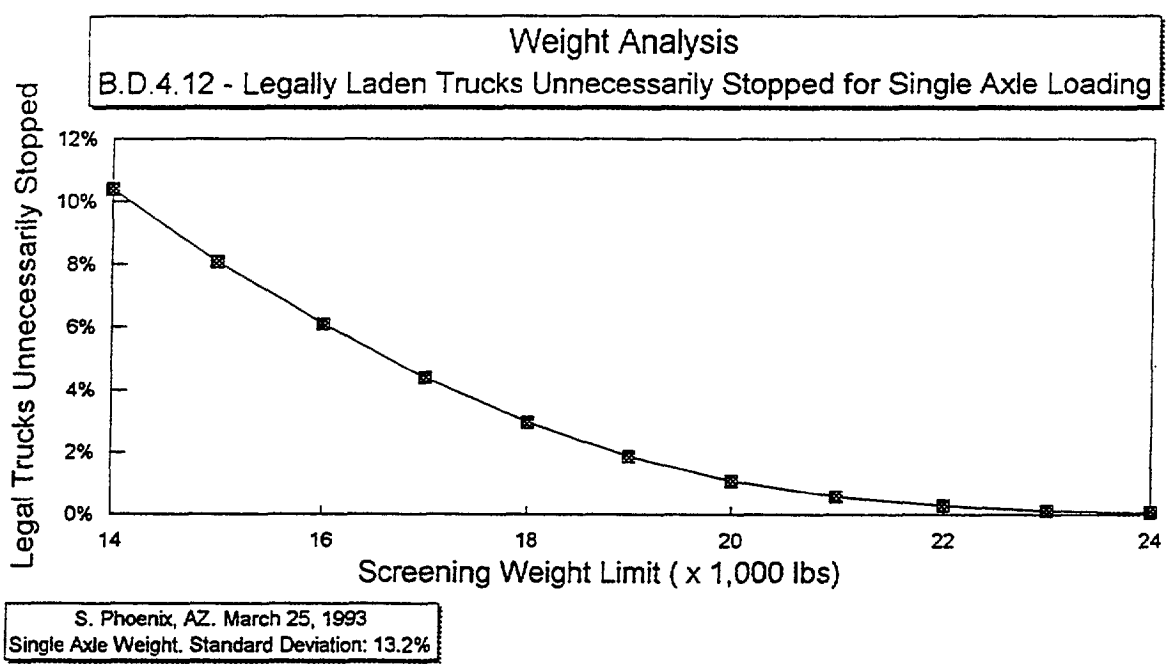

Weight Analysis
B.D.4.7 - Overweight Trucks Escaping Detection for Front Axle Loading
Overweight Trucks Escaping Detection
80%
60%
40%
20%
0%
10
11
12
13
14
15
Screening Weight Limit (x 1,000 lbs)
S. Phoenix, AZ. March 25, 1993
Front Axle Weight. Standard Deviation: 13.2%

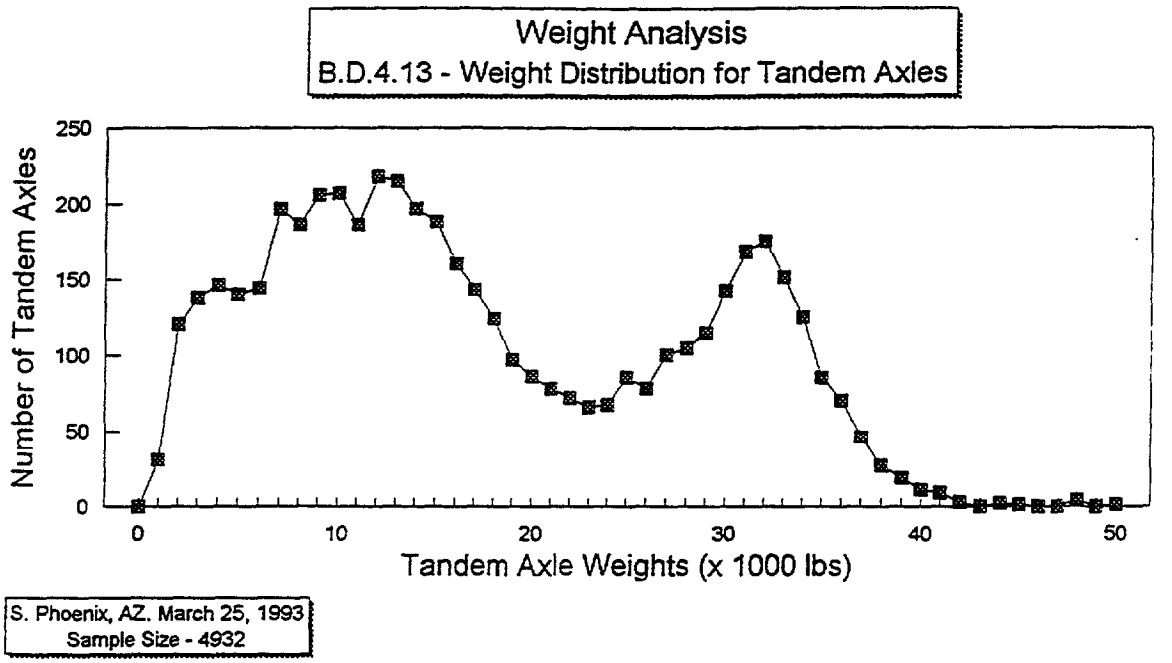

Weight Analysis
B.D.4.8 - Legally Laden Trucks Unnecessarily Stopped for Front Axle Loading
Legal Trucks Unnecessarily Stopped
20%
15%
10%
5%
0%
10
11
12
13
14
15
Screening Weight Limit (x 1,000 lbs)
S. Phoenix, AZ. March 25, 1993
Front Axle Weight. Standard Deviation: 13.2%

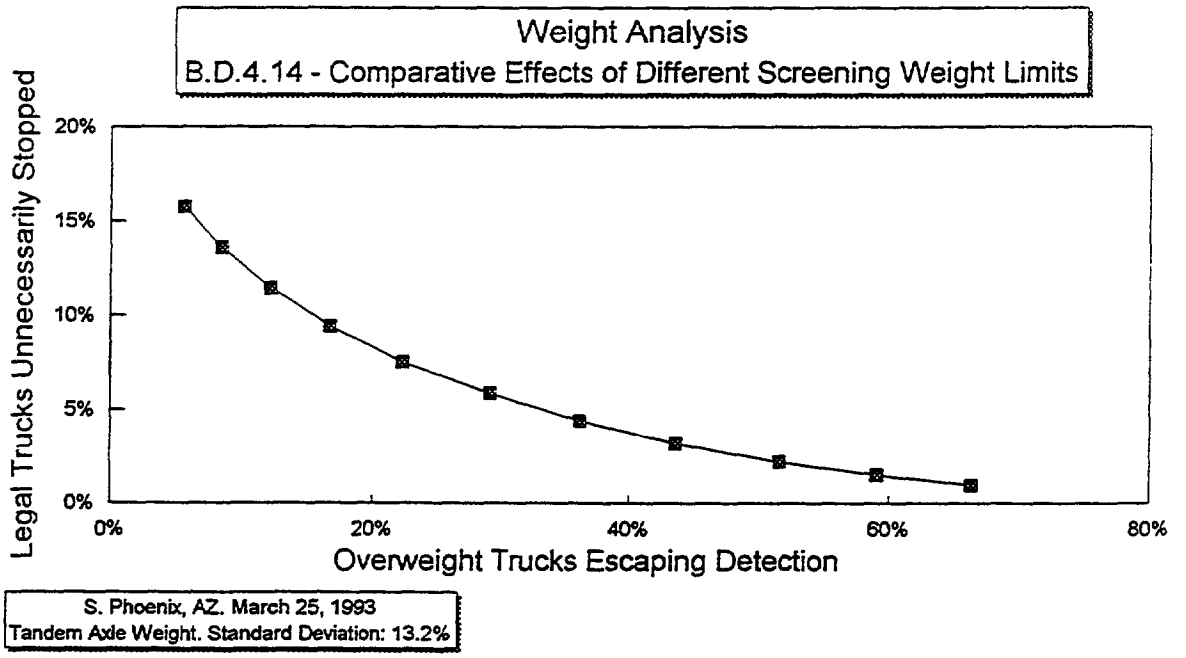

Weight Analysis
B.D.4.9 - Weight Distribution for Single Axles
Number of Single Axles
500
400
300
200
100
0
0
5
10
15
20
25
Single Axle Weights (x 1000 lbs)
S. Phoenix, AZ. March 25, 1993
Sample Size - 3974

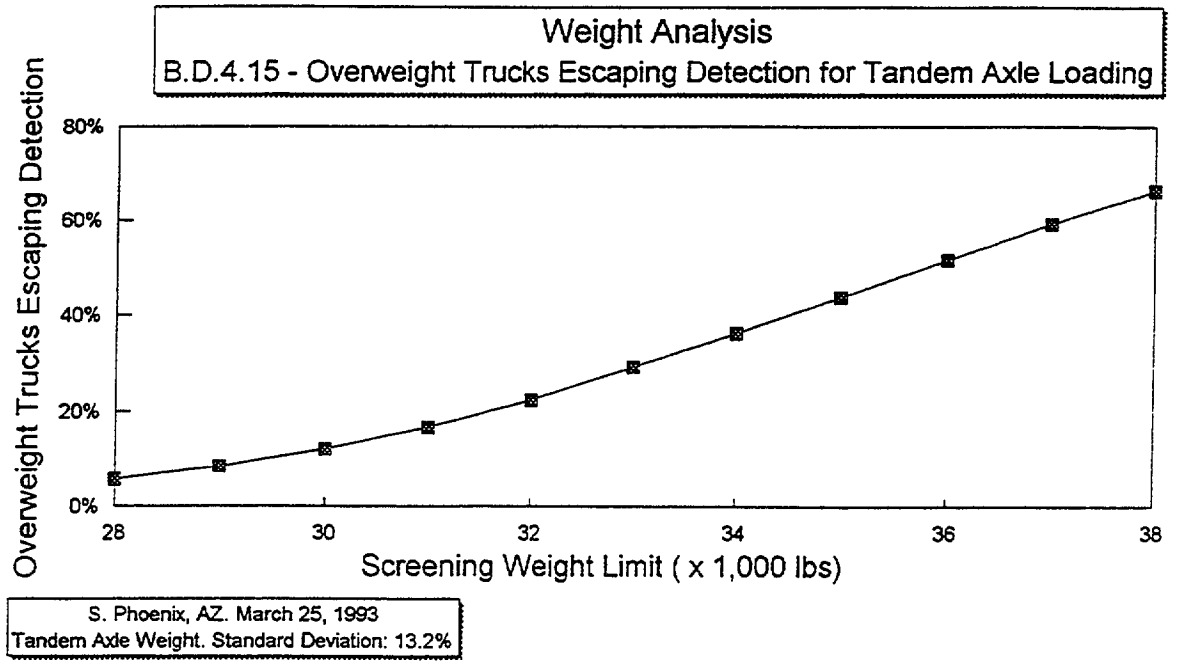

Weight Analysis
B.D.4.10 - Comparative Effects of Different Screening Weight Limits
Legal Trucks Unnecessarily Stopped
12%
10%
8%
6%
4%
2%
0%
0%
20%
40%
60%
80%
100%
Overweight Trucks Escaping Detection
S. Phoenix, AZ. March 25, 1993
Single Axle Weight. Standard Deviation: 13.2%

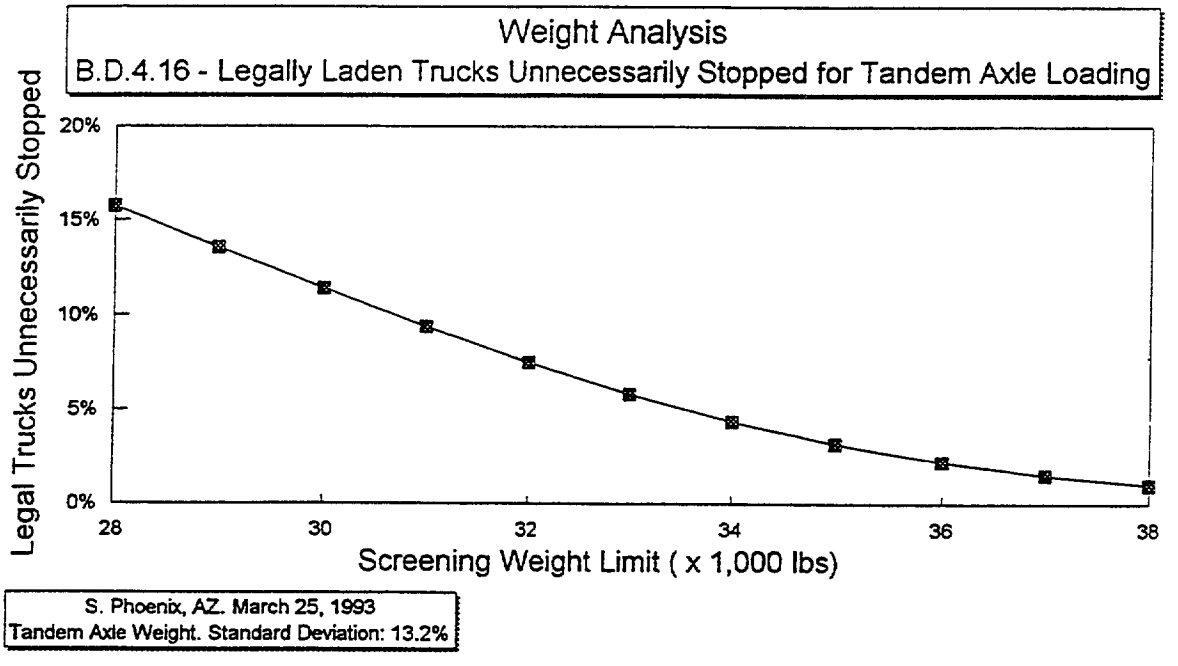

Weight Analysis
B.D.4.11 - Overweight Trucks Escaping Detection for Single Axle Loading
Overweight Trucks Escaping Detection
100%
80%
60%
40%
20%
0%
14
16
18
20
22
24
Screening Weight Limit (x 1,000 lbs)
S. Phoenix, AZ. March 25, 1993
Single Axle Weight. Standard Deviation: 13.2%

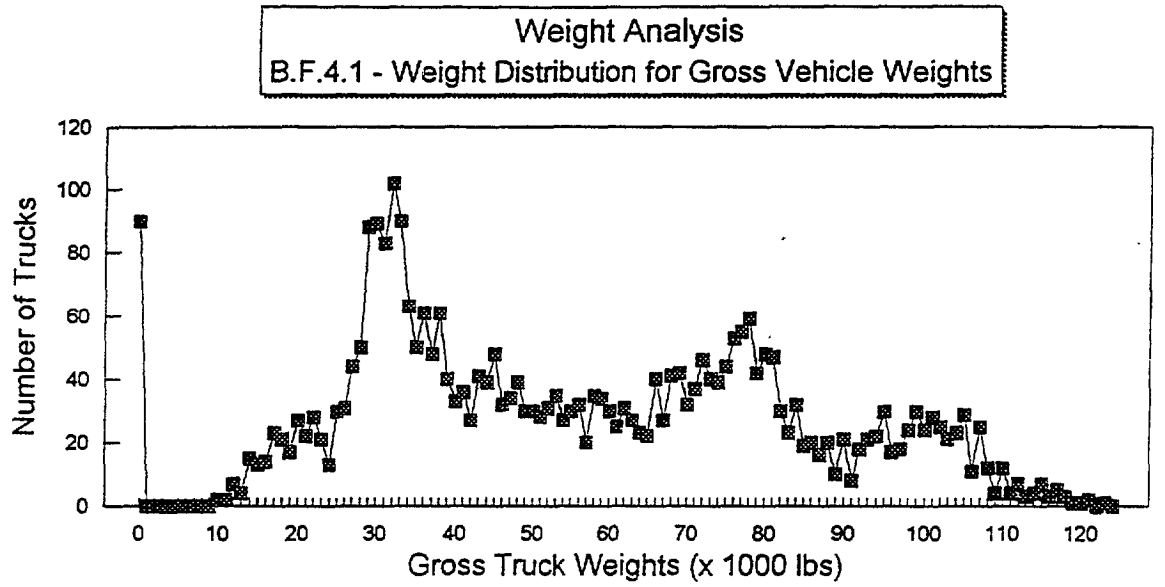

Weight Analysis
B.D.4.12 - Legally Laden Trucks Unnecessarily Stopped for Single Axle Loading
Legal Trucks Unnecessarily Stopped
12%
10%
8%
6%
4%
2%
0%
14
16
18
20
22
24
Screening Weight Limit (x 1,000 lbs)
S. Phoenix, AZ. March 25, 1993
Single Axle Weight. Standard Deviation: 13.2%

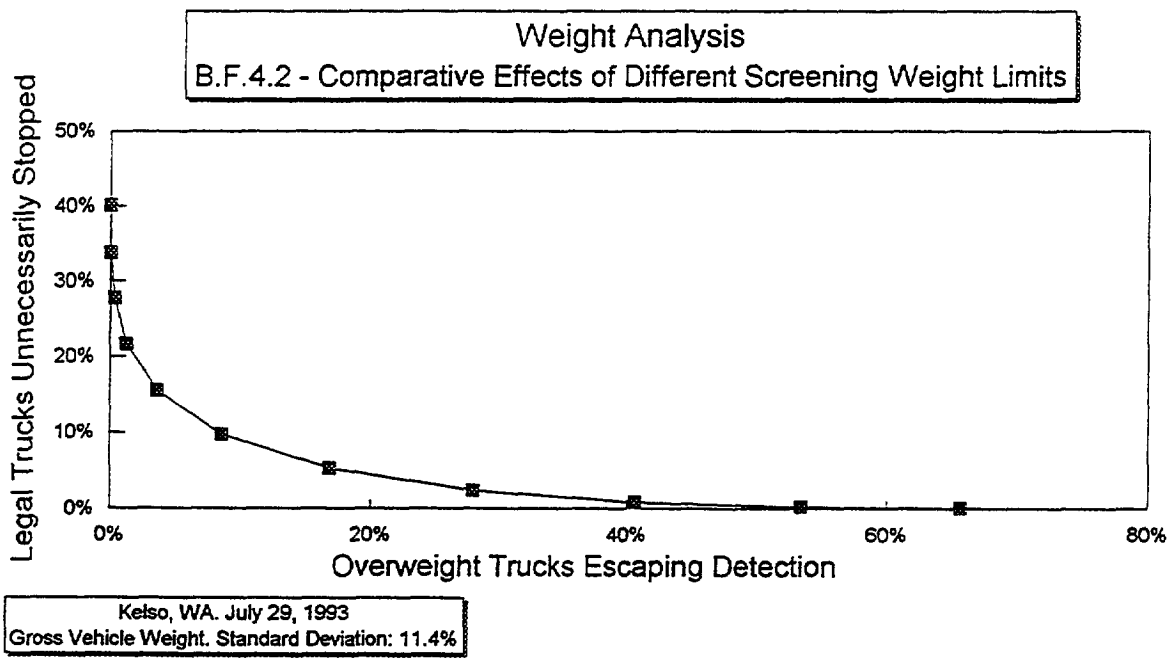

Weight Analysis
B.D.4.13 - Weight Distribution for Tandem Axles
Number of Tandem Axles
250
200
150
100
50
0
0
10
20
30
40
50
Tandem Axle Weights (x 1000 lbs)
S. Phoenix, AZ. March 25, 1993
Sample Size - 4932

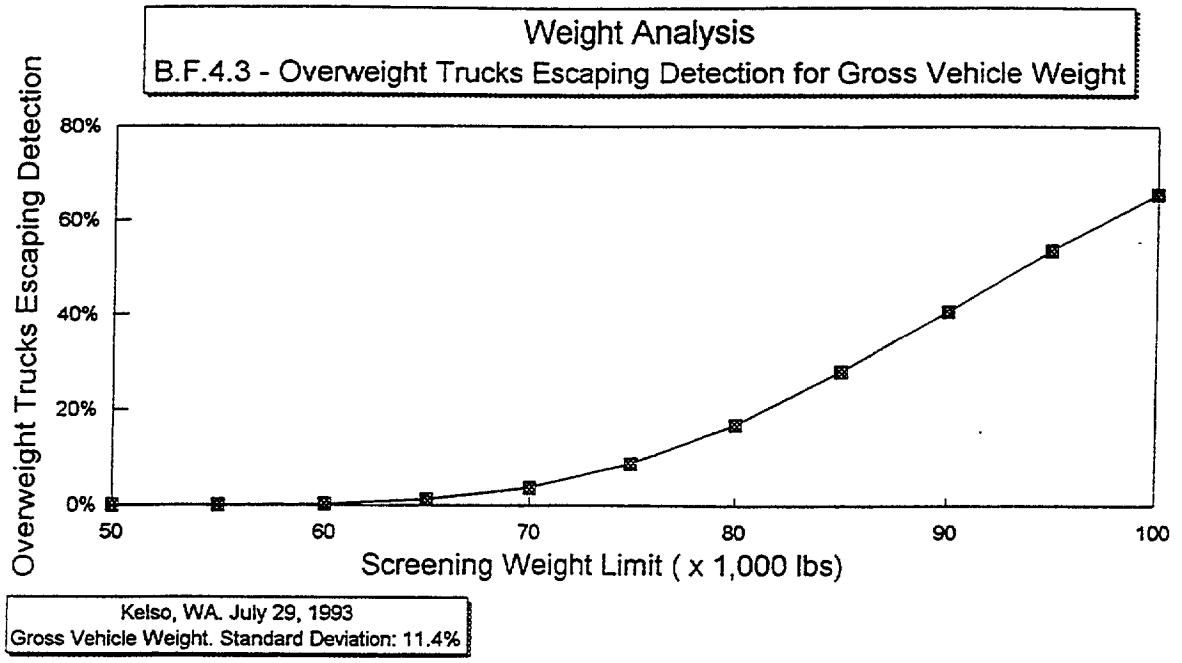

Weight Analysis
B.D.4.14 - Comparative Effects of Different Screening Weight Limits
Legal Trucks Unnecessarily Stopped
20%
15%
10%
5%
0%
0%
20%
40%
60%
80%
Overweight Trucks Escaping Detection
S. Phoenix, AZ. March 25, 1993
Tandem Axle Weight. Standard Deviation: 13.2%

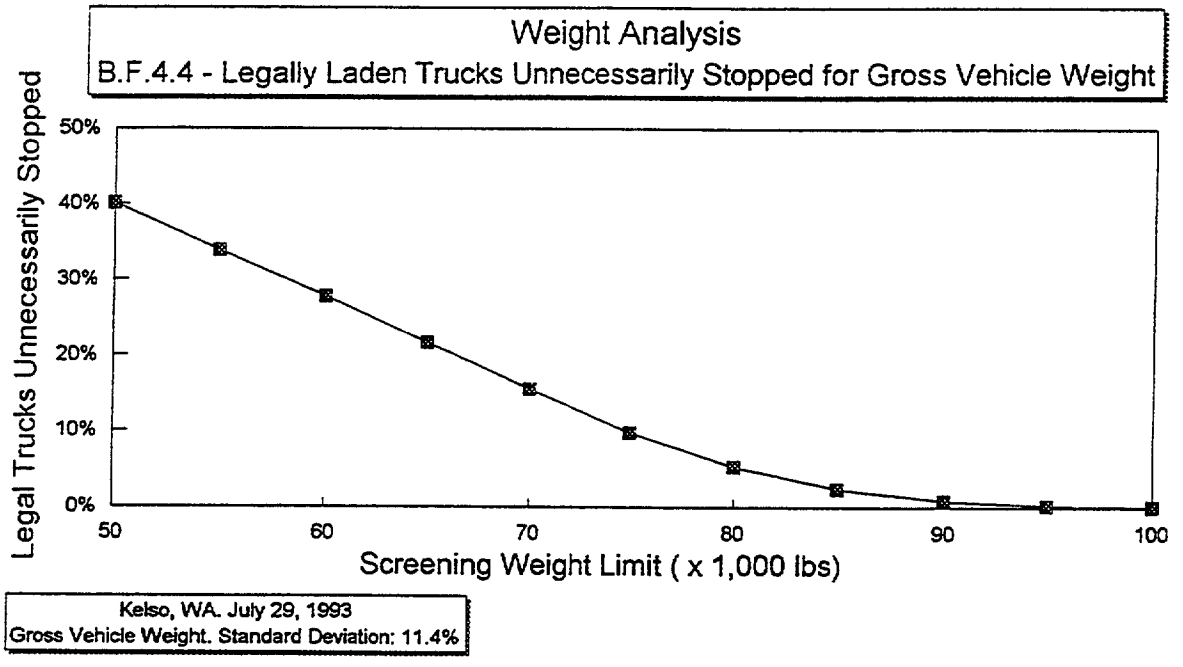

Weight Analysis
B.D.4.15 - Overweight Trucks Escaping Detection for Tandem Axle Loading
Overweight Trucks Escaping Detection
80%
60%
40%
20%
0%
28
30
32
34
36
38
Screening Weight Limit (x 1,000 lbs)
S. Phoenix, AZ. March 25, 1993
Tandem Axle Weight. Standard Deviation: 13.2%

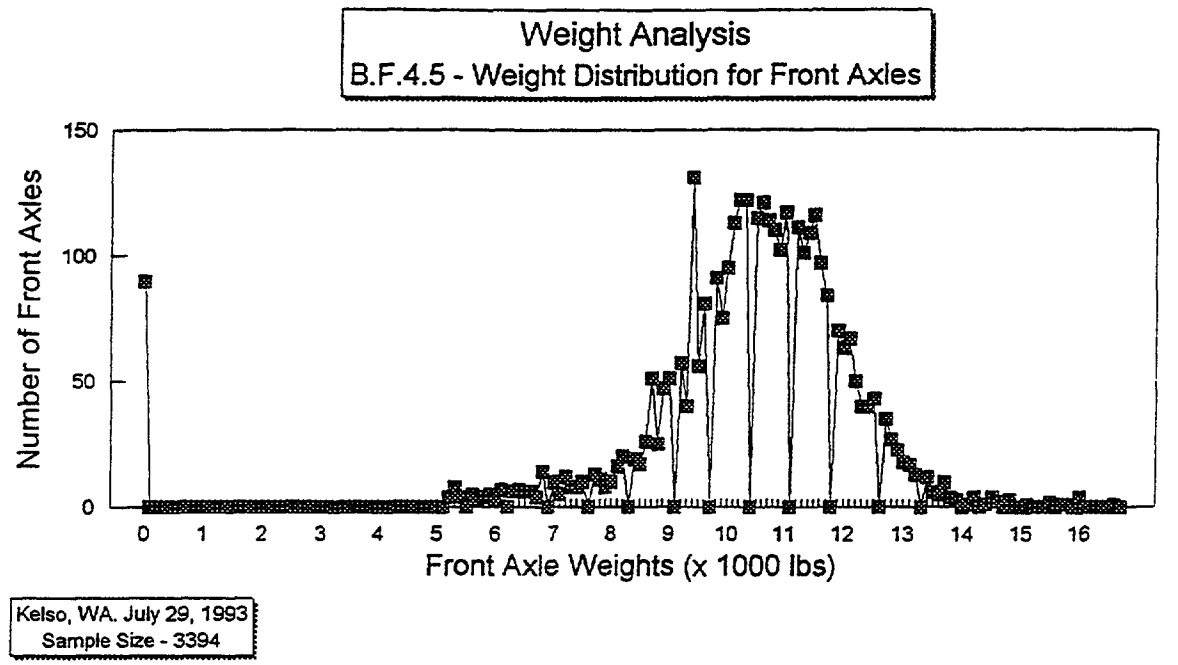

Weight Analysis
B.D.4.16 - Legally Laden Trucks Unnecessarily Stopped for Tandem Axle Loading
Legal Trucks Unnecessarily Stopped
20%
15%
10%
5%
0%
28
30
32
34
36
38
Screening Weight Limit (x 1,000 lbs)
S. Phoenix, AZ. March 25, 1993
Tandem Axle Weight. Standard Deviation: 13.2%

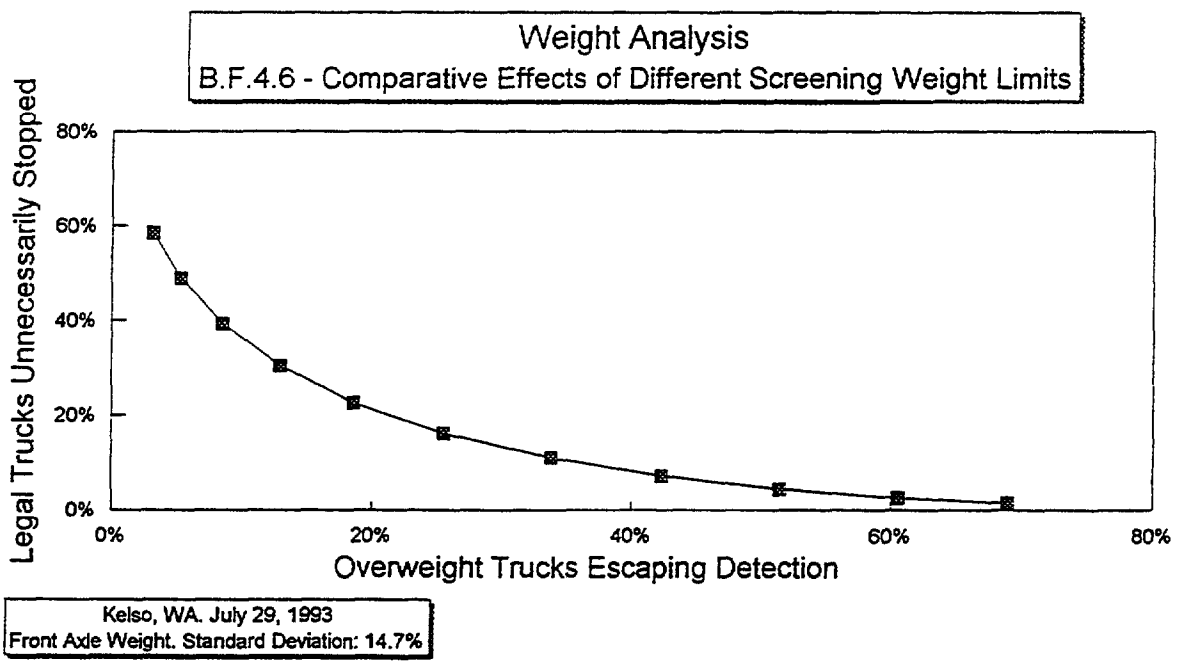

Weight Analysis
B.F.4.1 - Weight Distribution for Gross Vehicle Weights
Number of Trucks
0
20
40
60
80
100
120
0
10
20
30
40
50
60
70
80
90
100
110
120
Gross Truck Weights (x 1000 lbs)
Kelso, WA. July 29, 1993
Sample Size - 3394

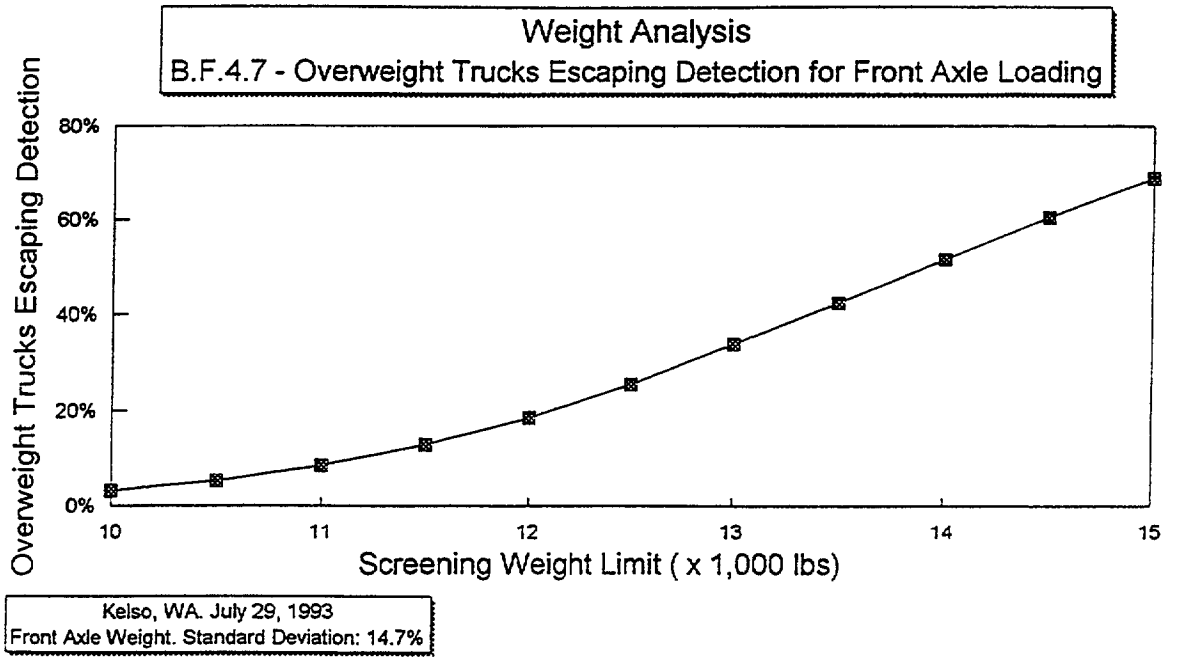

Weight Analysis
B.F.4.2 - Comparative Effects of Different Screening Weight Limits
Legal Trucks Unnecessarily Stopped
0%
10%
20%
30%
40%
50%
0%
20%
40%
60%
80%
Overweight Trucks Escaping Detection
Kelso, WA. July 29, 1993
Gross Vehicle Weight. Standard Deviation: 11.4%

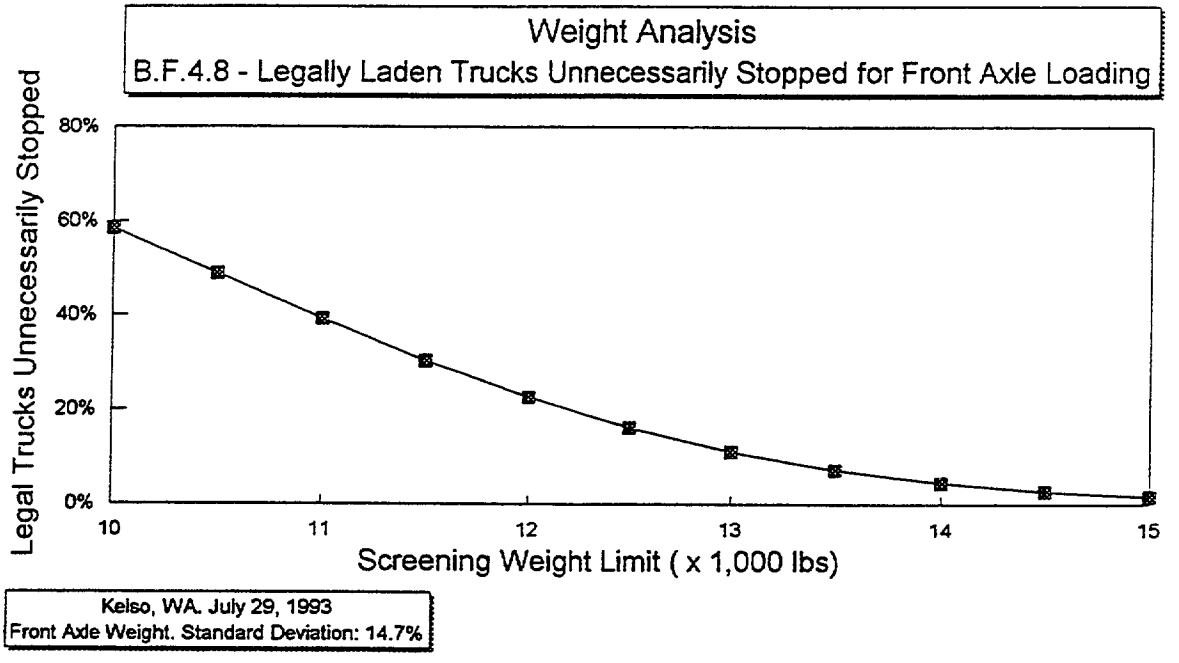

Weight Analysis
B.F.4.3 - Overweight Trucks Escaping Detection for Gross Vehicle Weight
Overweight Trucks Escaping Detection
80%
60%
40%
20%
0%
50
60
70
80
90
100
Screening Weight Limit (x 1,000 lbs)
Kelso, WA. July 29, 1993
Gross Vehicle Weight. Standard Deviation: 11.4%

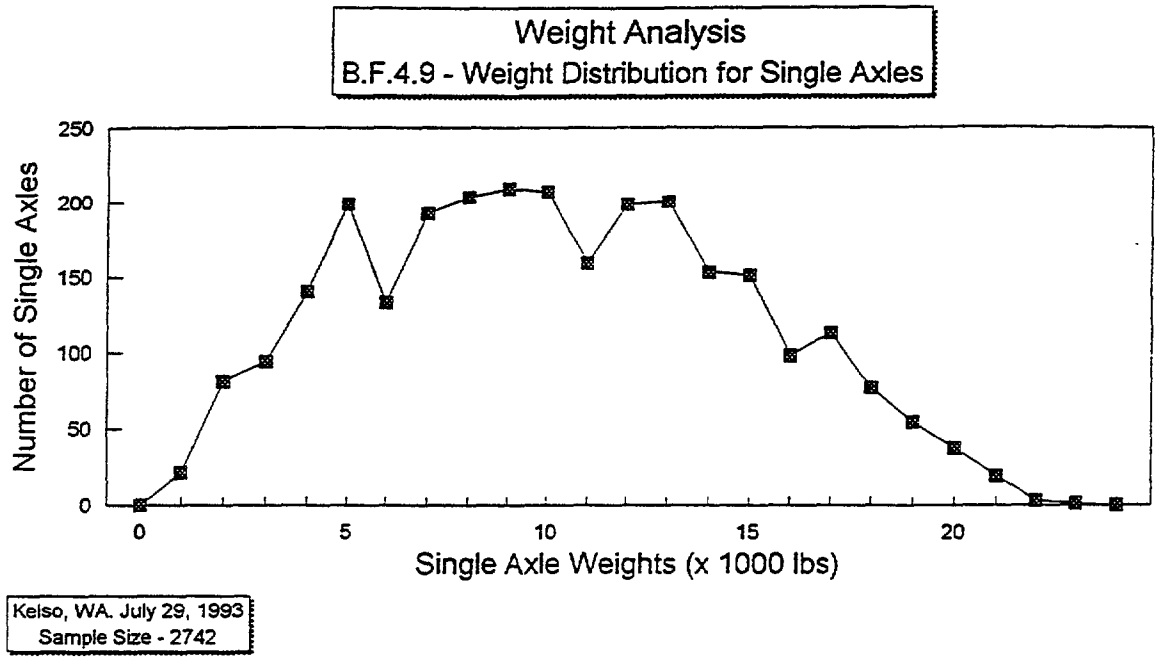

Weight Analysis
B.F.4.4 - Legally Laden Trucks Unnecessarily Stopped for Gross Vehicle Weight
Legal Trucks Unnecessarily Stopped
50%
40%
30%
20%
10%
0%
50
60
70
80
90
100
Screening Weight Limit (x 1,000 lbs)
Kelso, WA. July 29, 1993
Gross Vehicle Weight. Standard Deviation: 11.4%

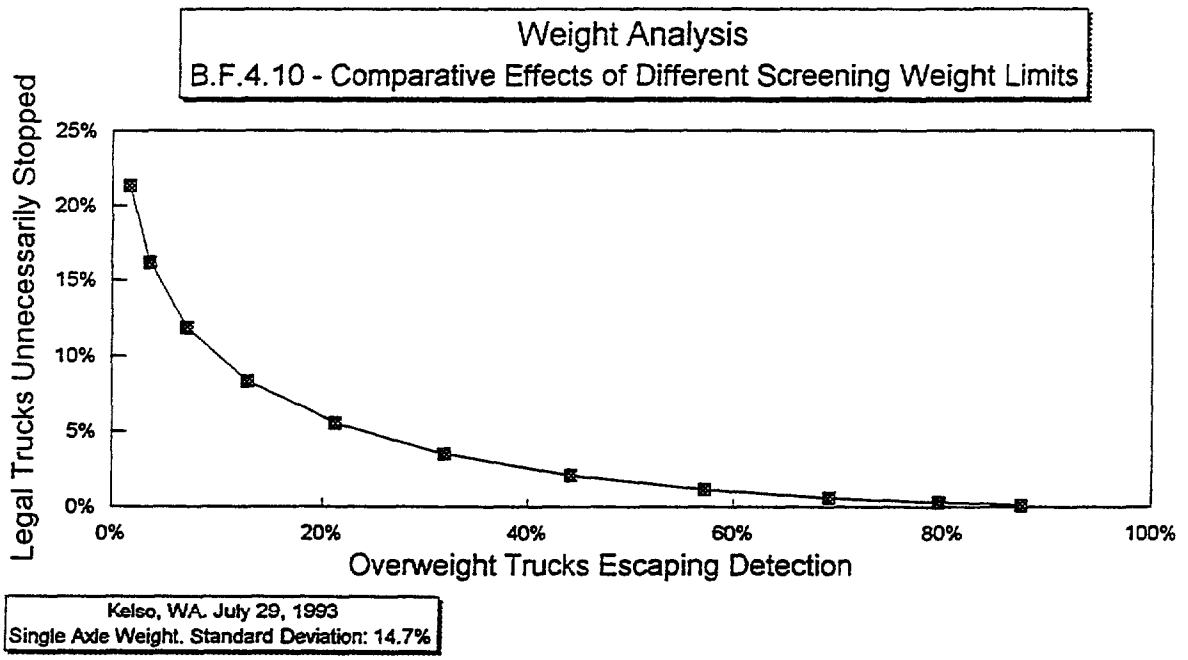

Weight Analysis
B.F.4.5 - Weight Distribution for Front Axles
Number of Front Axles
150
100
50
0
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
Front Axle Weights (x 1000 lbs)
Kelso, WA. July 29, 1993
Sample Size - 3394

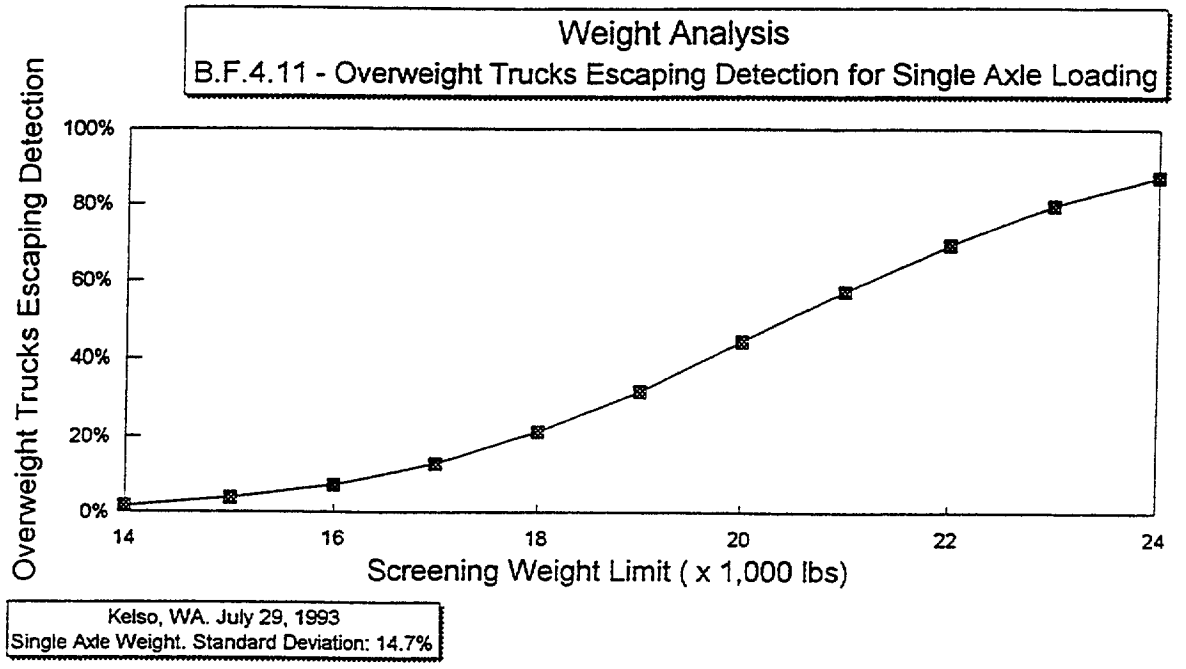

Weight Analysis
B.F.4.6 - Comparative Effects of Different Screening Weight Limits
Legal Trucks Unnecessarily Stopped
80%
60%
40%
20%
0%
0% 20% 40% 60% 80%
Overweight Trucks Escaping Detection
Kelso, WA. July 29, 1993
Front Axle Weight. Standard Deviation: 14.7%

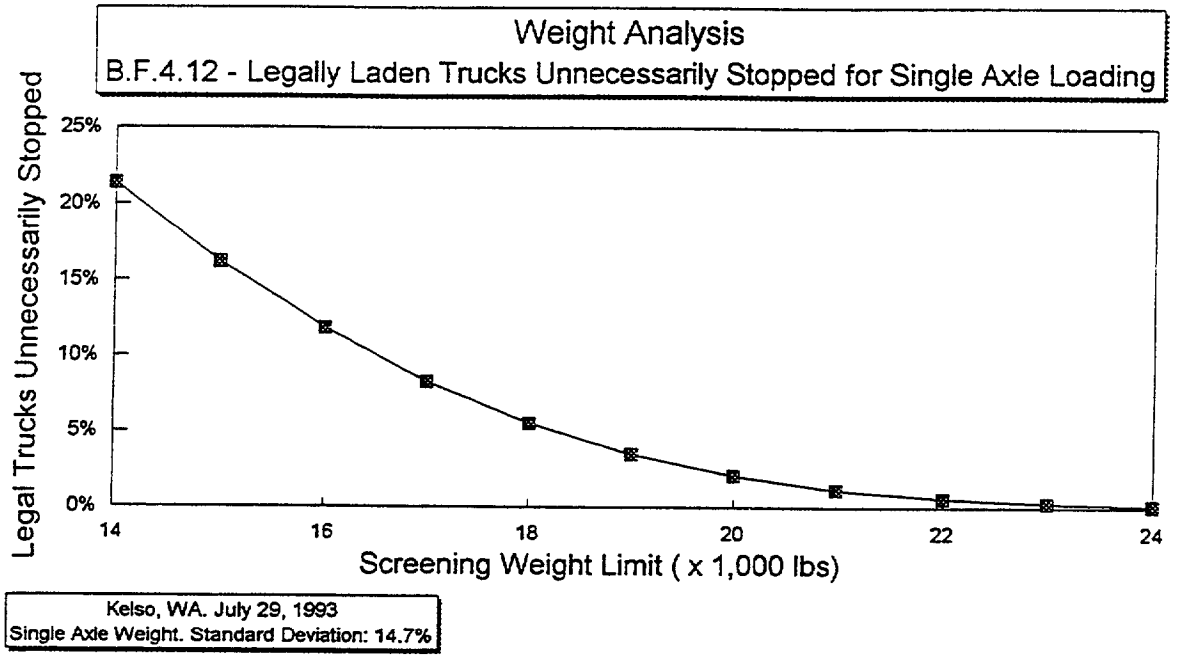

Weight Analysis
B.F.4.7 - Overweight Trucks Escaping Detection for Front Axle Loading
Overweight Trucks Escaping Detection
80%
60%
40%
20%
0%
10
11
12
13
14
15
Screening Weight Limit (x 1,000 lbs)
Kelso, WA. July 29, 1993
Front Axle Weight. Standard Deviation: 14.7%

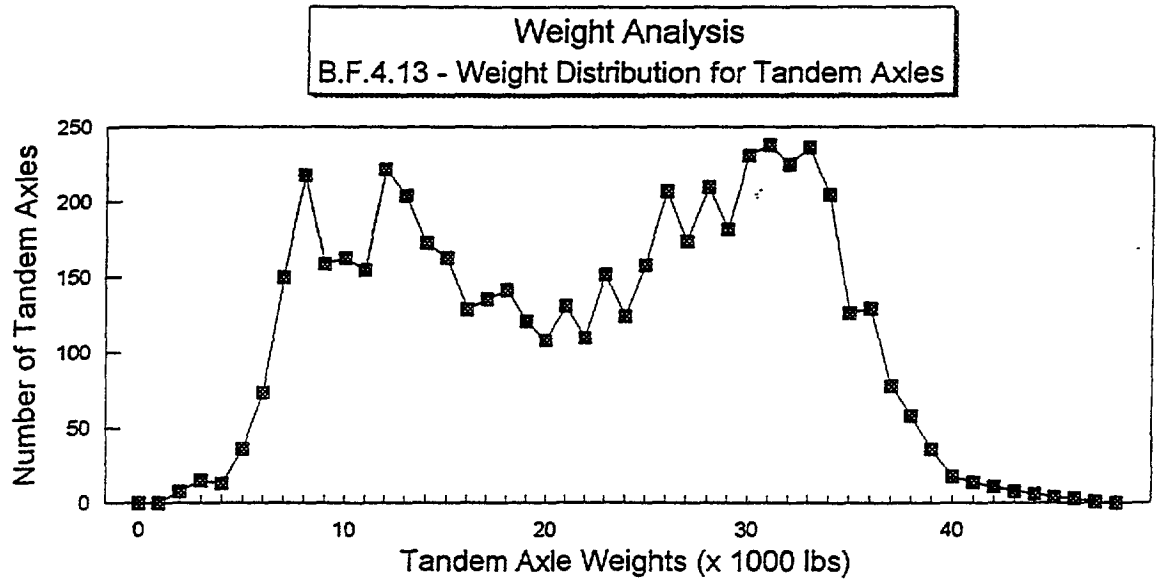

Weight Analysis
B.F.4.8 - Legally Laden Trucks Unnecessarily Stopped for Front Axle Loading
Legal Trucks Unnecessarily Stopped
80%
60%
40%
20%
0%
10
11
12
13
14
15
Screening Weight Limit (x 1,000 lbs)
Kelso, WA. July 29, 1993
Front Axle Weight. Standard Deviation: 14.7%

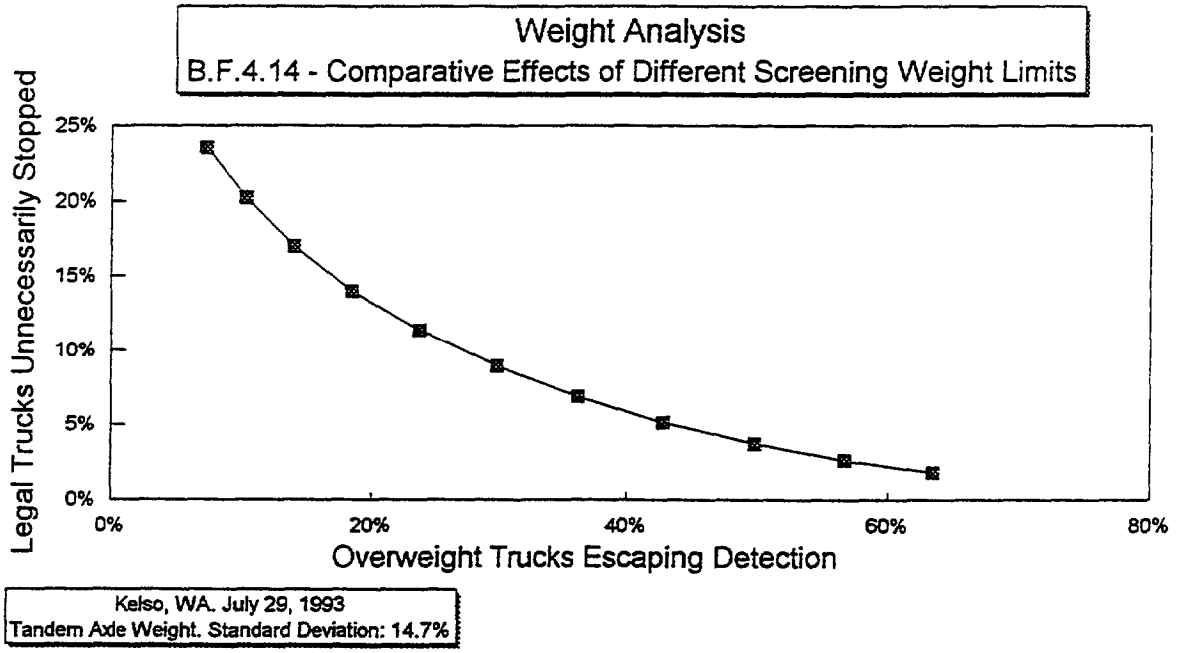

Weight Analysis
B.F.4.9 - Weight Distribution for Single Axles
Number of Single Axles
250
200
150
100
50
0
0
5
10
15
20
Single Axle Weights (x 1000 lbs)
Kelso, WA. July 29, 1993
Sample Size - 2742

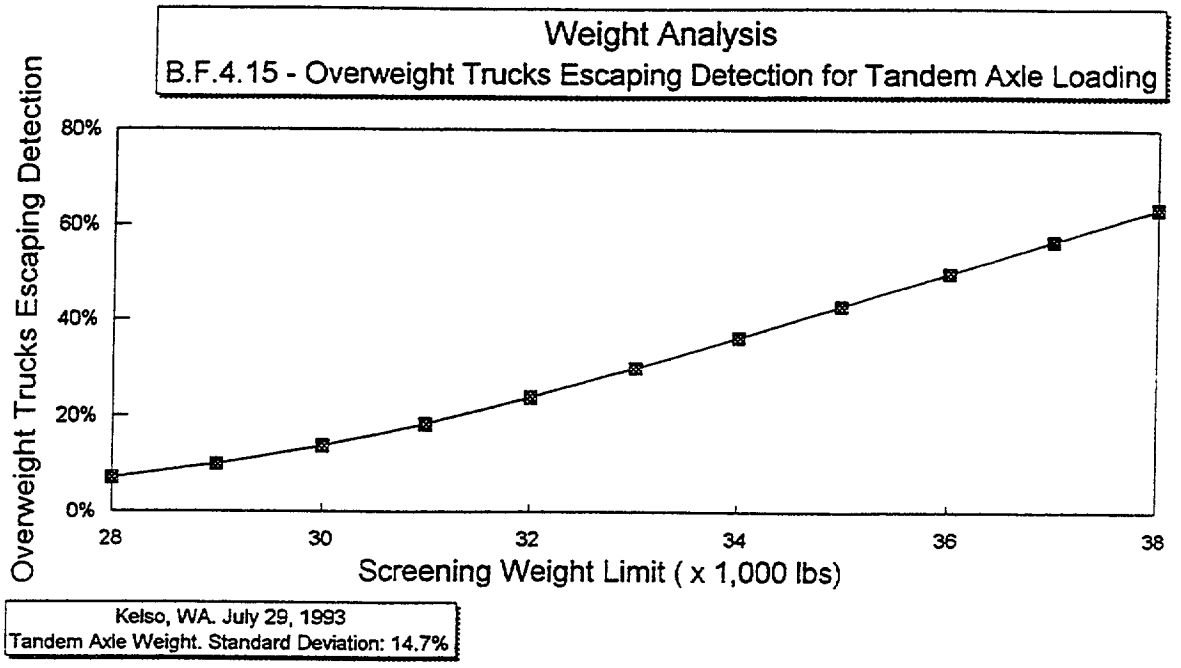

Weight Analysis
B.F.4.10 - Comparative Effects of Different Screening Weight Limits
Legal Trucks Unnecessarily Stopped
25%
20%
15%
10%
5%
0%
0%
20%
40%
60%
80%
100%
Overweight Trucks Escaping Detection
Kelso, WA. July 29, 1993
Single Axle Weight. Standard Deviation: 14.7%

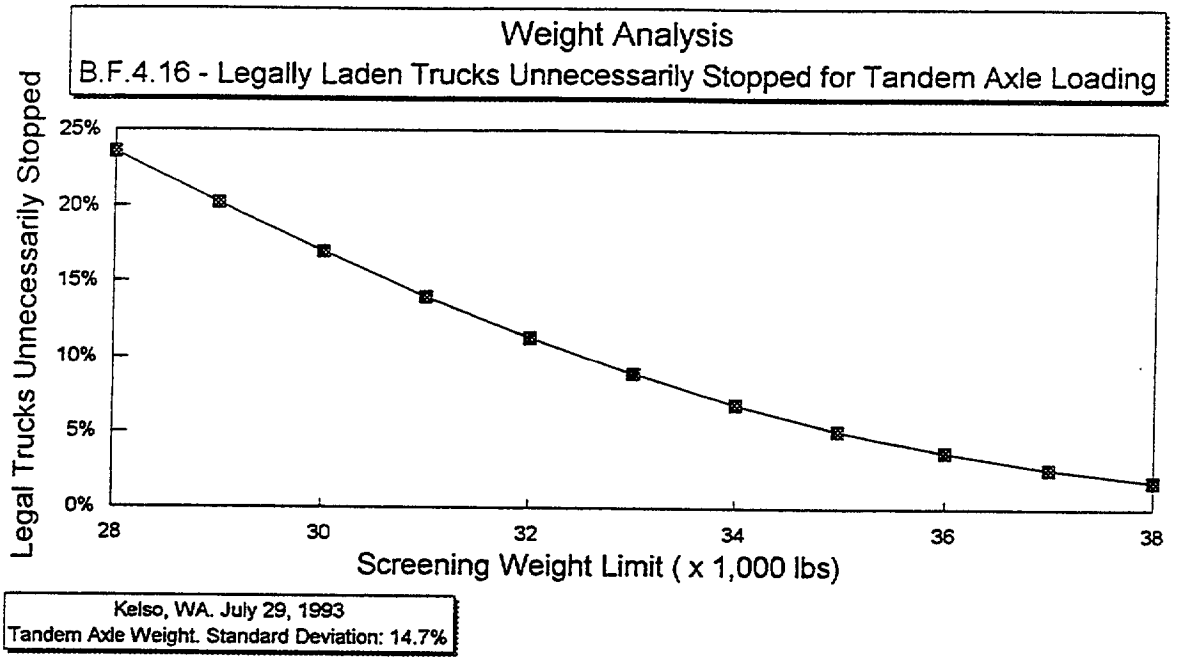

Weight Analysis
B.F.4.11 - Overweight Trucks Escaping Detection for Single Axle Loading
Overweight Trucks Escaping Detection
100%
80%
60%
40%
20%
0%
14
16
18
20
22
24
Screening Weight Limit (x 1,000 lbs)
Kelso, WA. July 29, 1993
Single Axle Weight. Standard Deviation: 14.7%

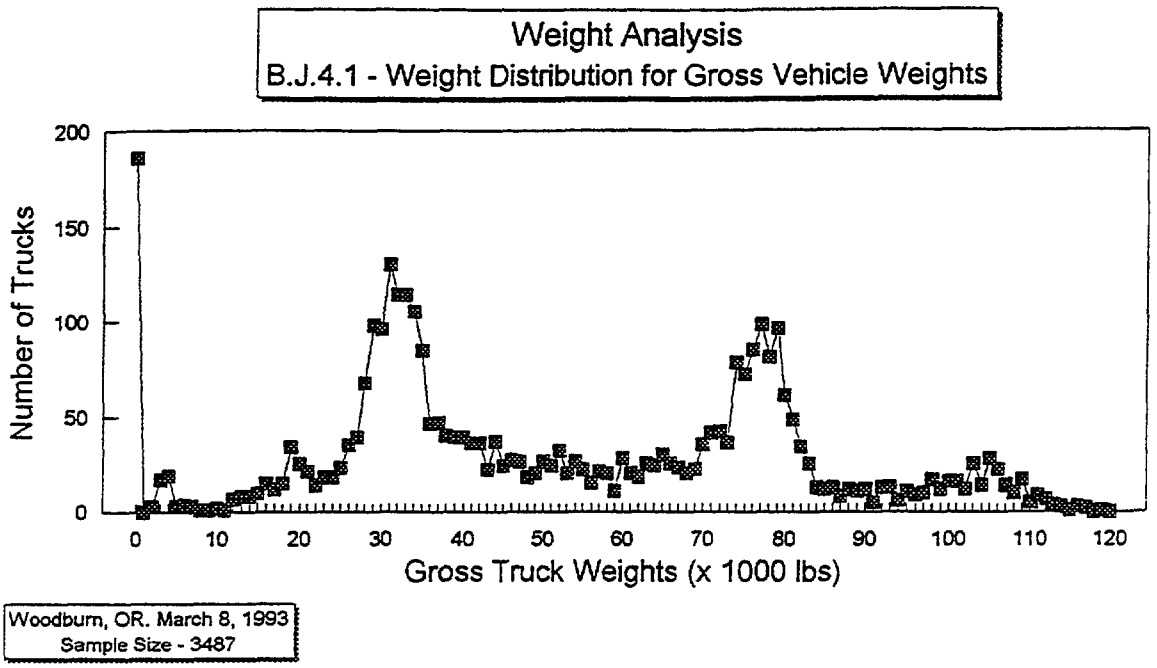

Weight Analysis
B.F.4.12 - Legally Laden Trucks Unnecessarily Stopped for Single Axle Loading
Legal Trucks Unnecessarily Stopped
25%
20%
15%
10%
5%
0%
14
16
18
20
22
24
Screening Weight Limit (x 1,000 lbs)
Kelso, WA. July 29, 1993
Single Axle Weight. Standard Deviation: 14.7%

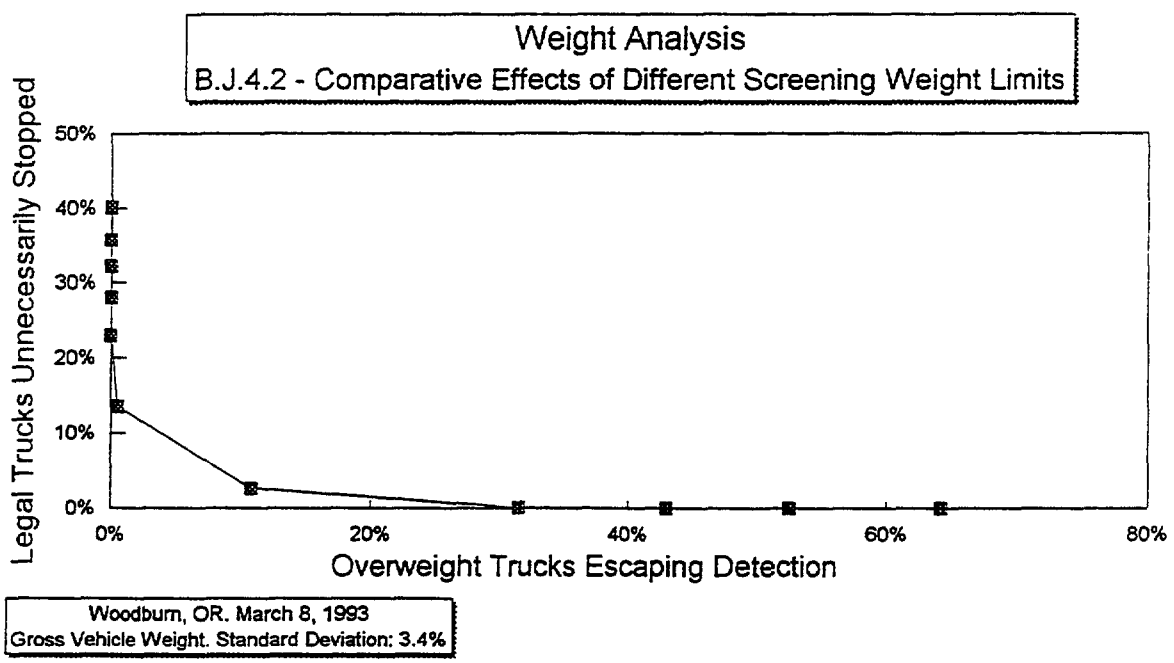

Weight Analysis
B.F.4.13 - Weight Distribution for Tandem Axles
Number of Tandem Axles
250
200
150
100
50
0
0
10
20
30
40
Tandem Axle Weights (x 1000 lbs)
Kelso, WA. July 29, 1993
Sample Size - 5465

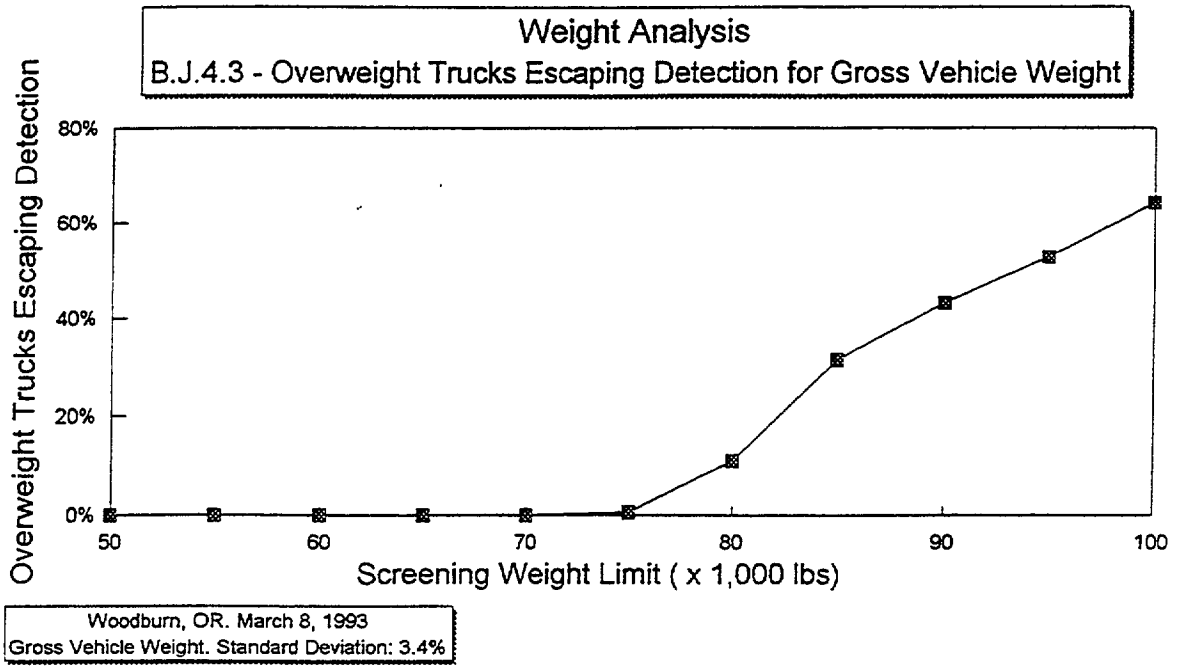

Weight Analysis
B.F.4.14 - Comparative Effects of Different Screening Weight Limits
Legal Trucks Unnecessarily Stopped
25%
20%
15%
10%
5%
0%
0%
20%
40%
60%
80%
Overweight Trucks Escaping Detection
Kelso, WA. July 29, 1993
Tandem Axle Weight. Standard Deviation: 14.7%

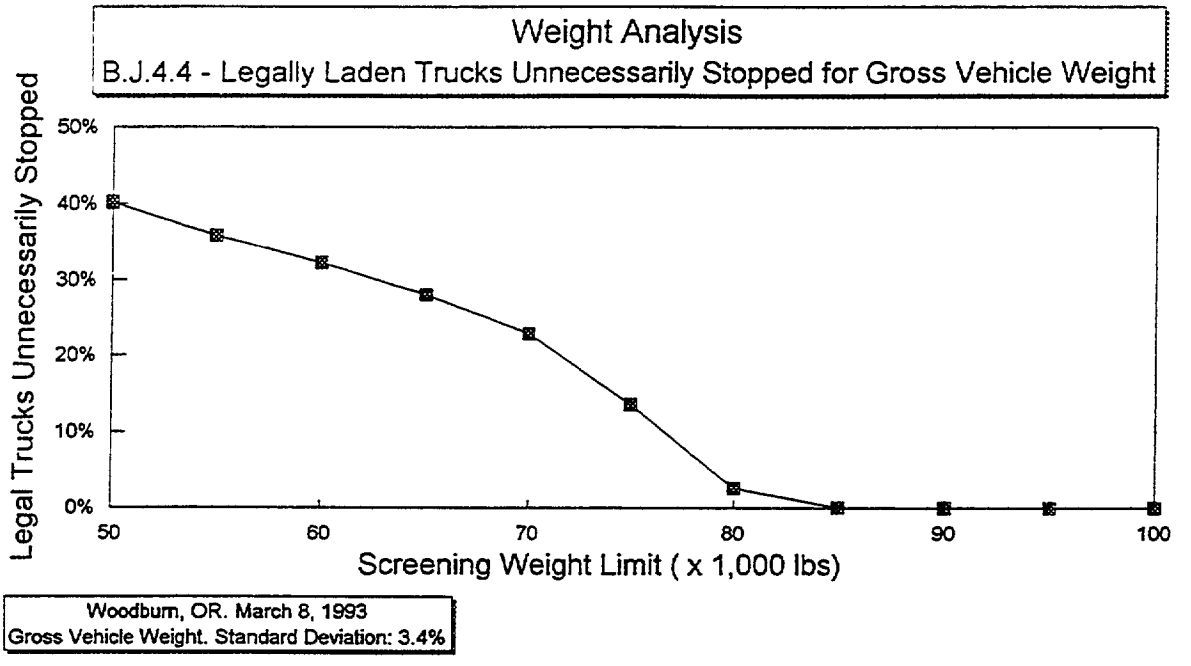

Weight Analysis
B.F.4.15 - Overweight Trucks Escaping Detection for Tandem Axle Loading
Overweight Trucks Escaping Detection
80%
60%
40%
20%
0%
28
30
32
34
36
38
Screening Weight Limit (x 1,000 lbs)
Kelso, WA. July 29, 1993
Tandem Axle Weight. Standard Deviation: 14.7%

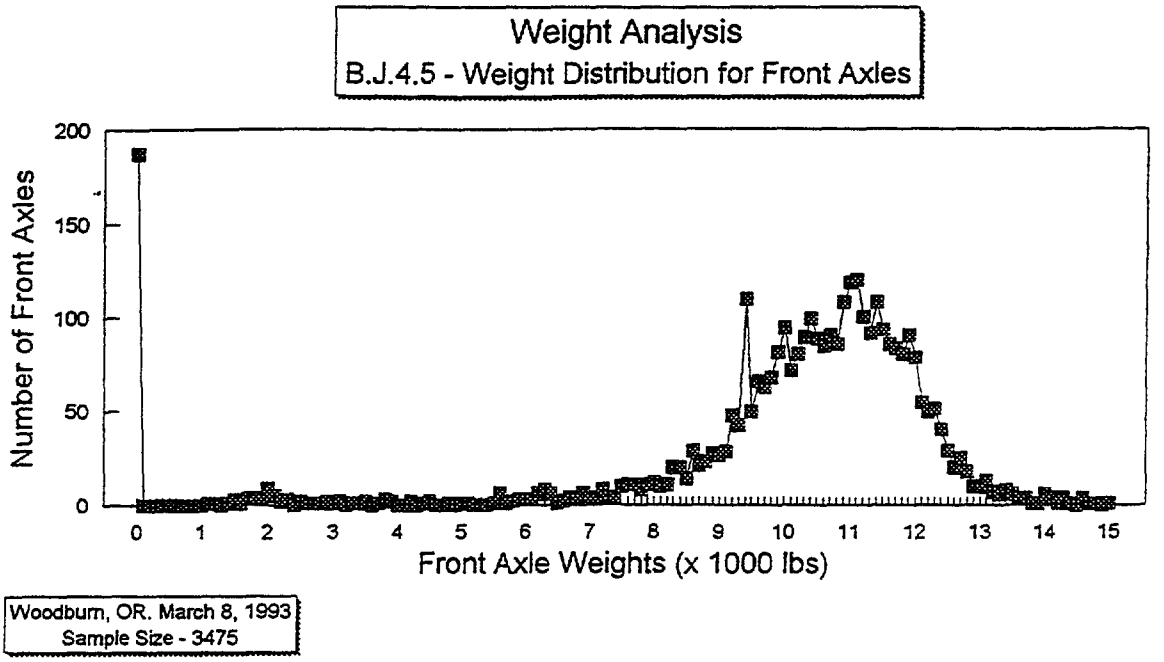

Weight Analysis
B.F.4.16 - Legally Laden Trucks Unnecessarily Stopped for Tandem Axle Loading
Legal Trucks Unnecessarily Stopped
25%
20%
15%
10%
5%
0%
28
30
32
34
36
38
Screening Weight Limit (x 1,000 lbs)
Kelso, WA. July 29, 1993
Tandem Axle Weight. Standard Deviation: 14.7%

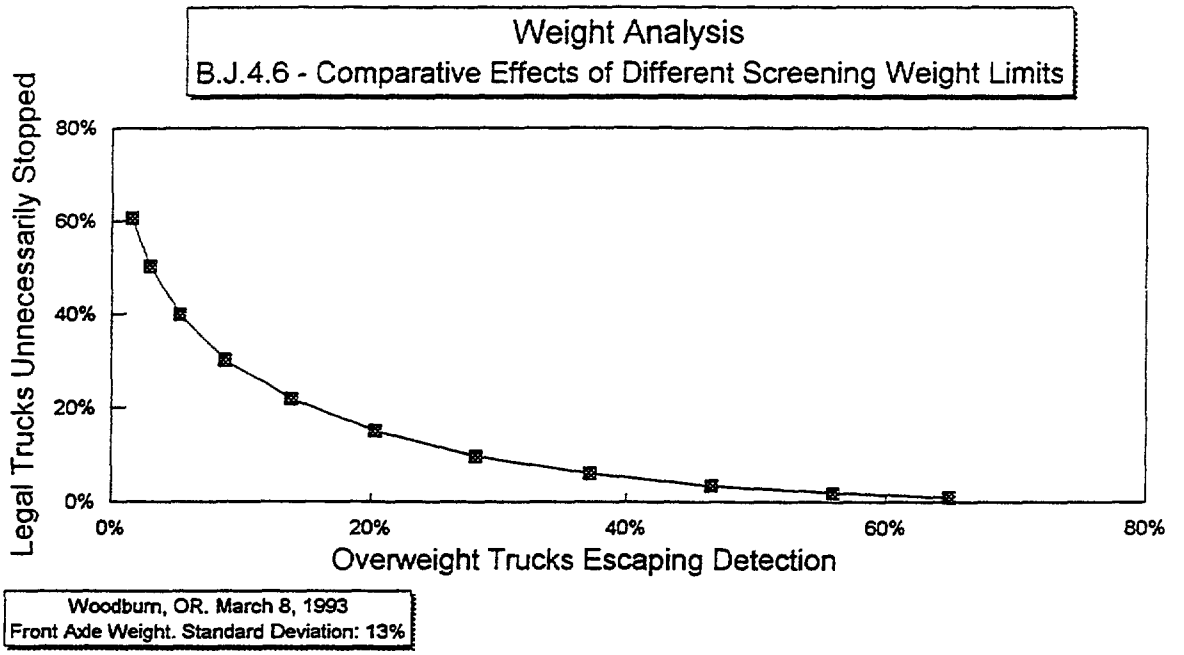

Weight Analysis
B.J.4.1 - Weight Distribution for Gross Vehicle Weights
Number of Trucks
200
150
100
50
0
0
10
20
30
40
50
60
70
80
90
100
110
120
Gross Truck Weights (x 1000 lbs)
Woodburn, OR. March 8, 1993
Sample Size - 3487

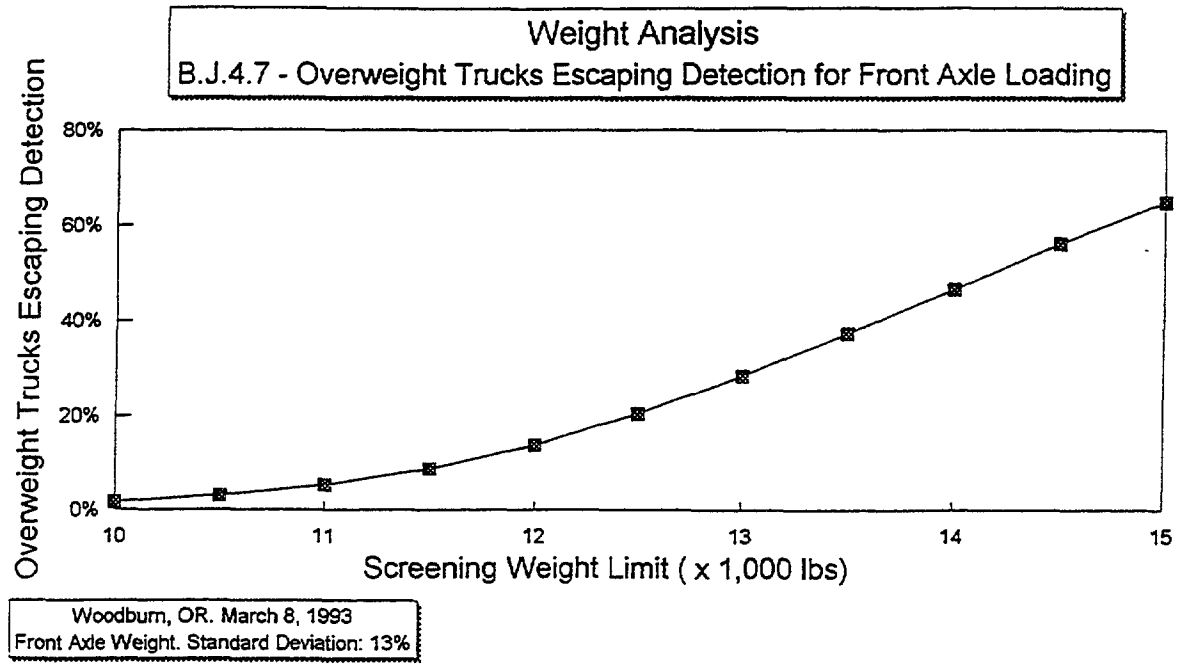

Weight Analysis
B.J.4.2 - Comparative Effects of Different Screening Weight Limits
Legal Trucks Unnecessarily Stopped
50%
40%
30%
20%
10%
0%
0%
20%
40%
60%
80%
Overweight Trucks Escaping Detection
Woodburn, OR. March 8, 1993
Gross Vehicle Weight. Standard Deviation: 3.4%

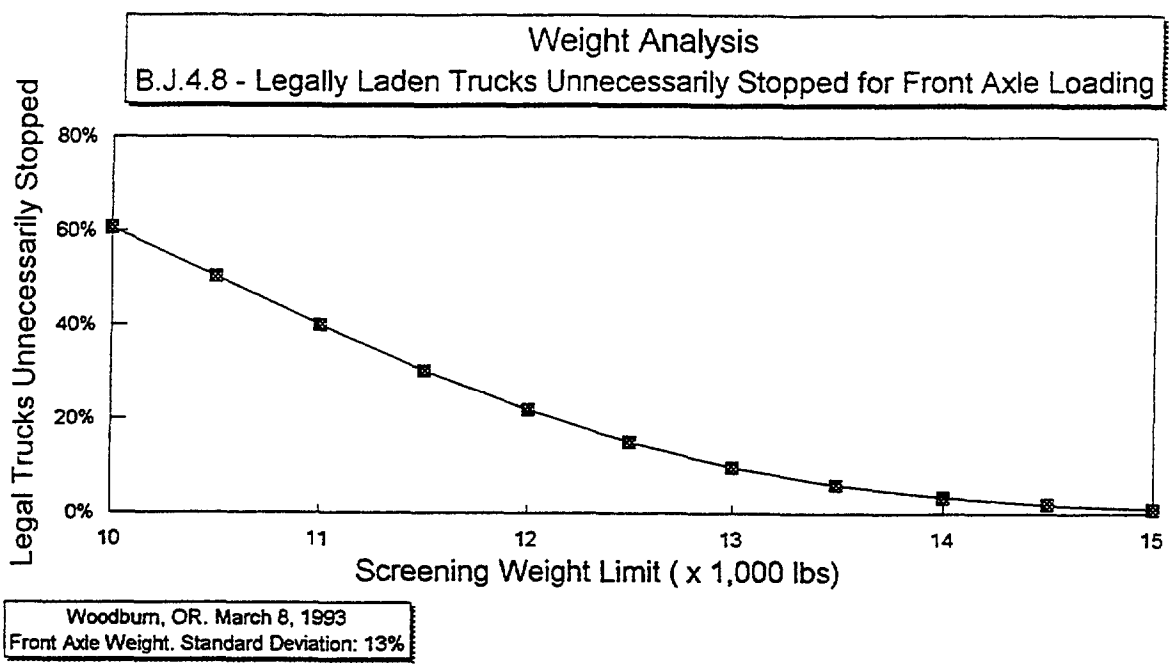

Weight Analysis
B.J.4.3 - Overweight Trucks Escaping Detection for Gross Vehicle Weight
Overweight Trucks Escaping Detection
80%
60%
40%
20%
0%
50
60
70
80
90
100
Screening Weight Limit (x 1,000 lbs)
Woodburn, OR. March 8, 1993
Gross Vehicle Weight. Standard Deviation: 3.4%

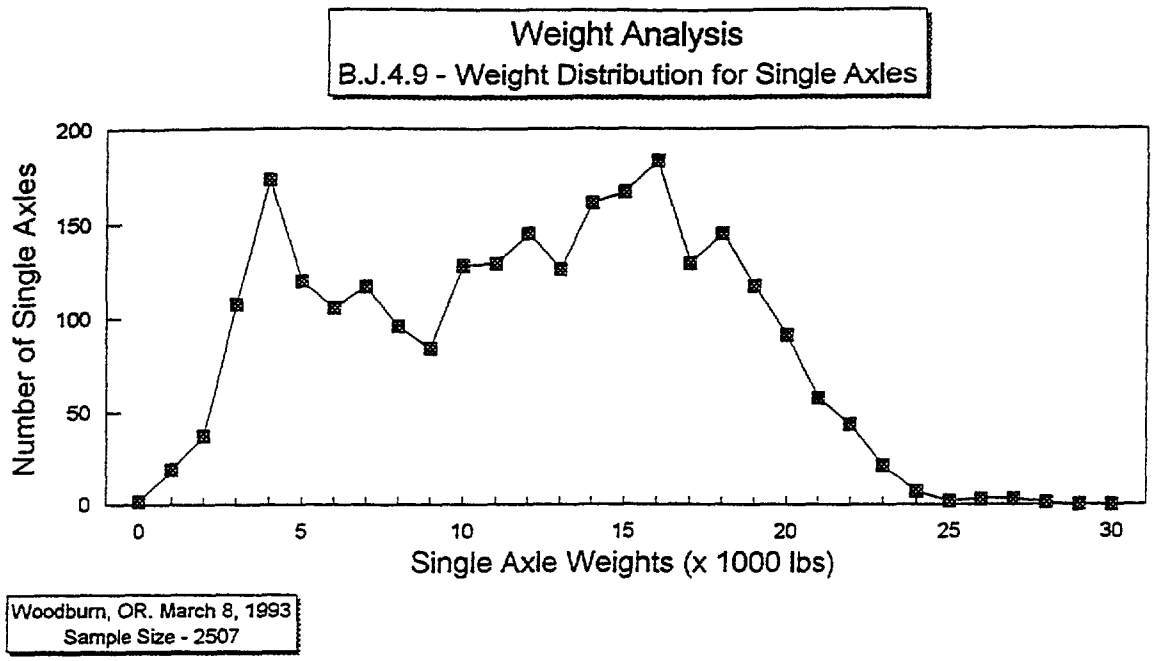

Weight Analysis
B.J.4.4 - Legally Laden Trucks Unnecessarily Stopped for Gross Vehicle Weight
Legal Trucks Unnecessarily Stopped
50%
40%
30%
20%
10%
0%
50
60
70
80
90
100
Screening Weight Limit (x 1,000 lbs)
Woodburn, OR. March 8, 1993
Gross Vehicle Weight. Standard Deviation: 3.4%

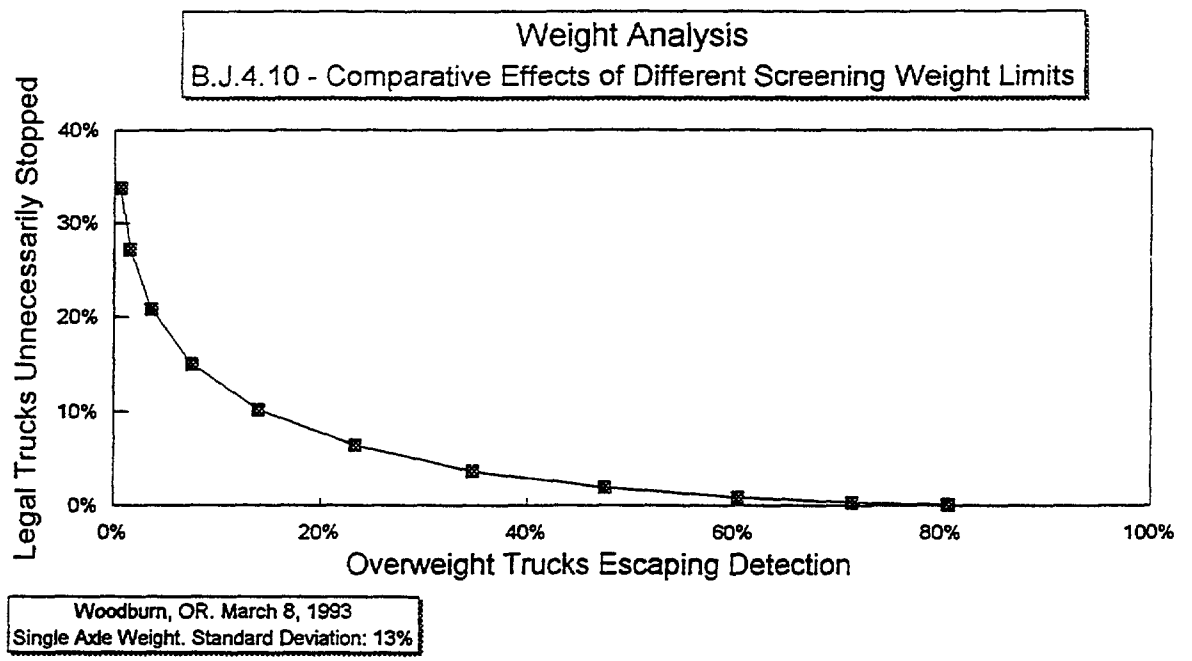

Weight Analysis
B.J.4.5 - Weight Distribution for Front Axles
Number of Front Axles
200
150
100
50
0
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
Front Axle Weights (x 1000 lbs)
Woodburn, OR. March 8, 1993
Sample Size - 3475

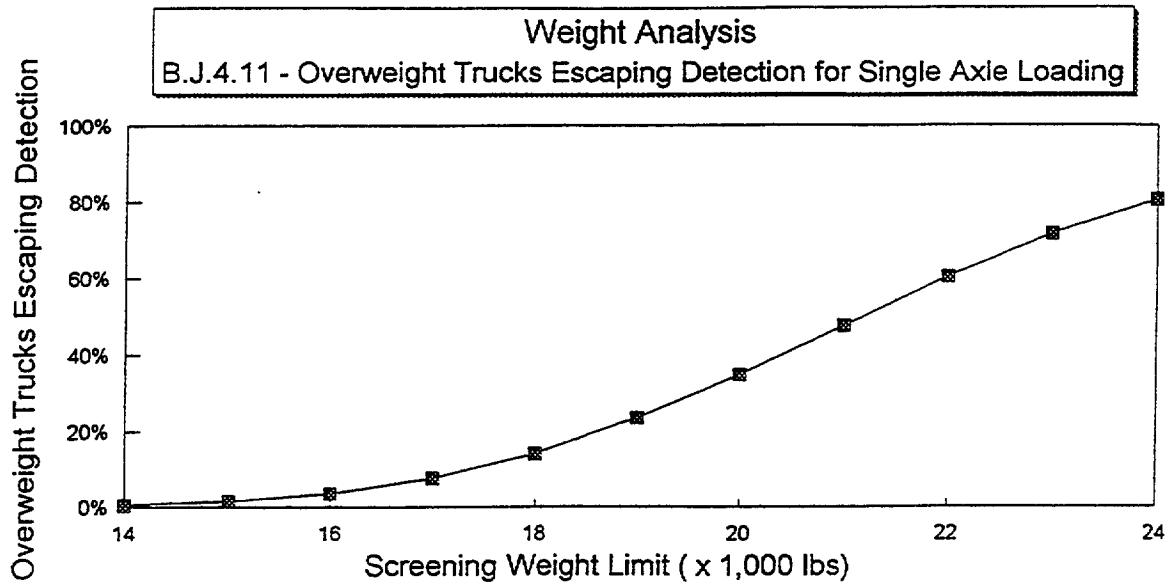

Weight Analysis
B.J.4.6 - Comparative Effects of Different Screening Weight Limits
Legal Trucks Unnecessarily Stopped
80%
60%
40%
20%
0%
0% 20% 40% 60% 80%
Overweight Trucks Escaping Detection
Woodburn, OR. March 8, 1993
Front Axle Weight. Standard Deviation: 13%

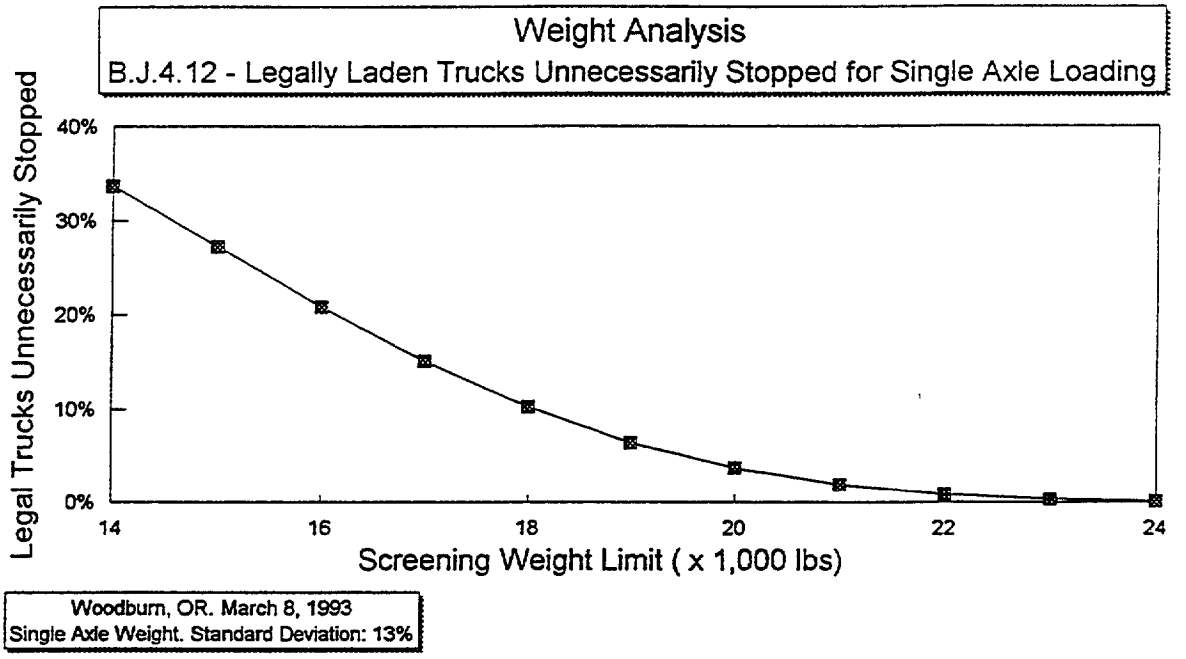

Weight Analysis
B.J.4.7 - Overweight Trucks Escaping Detection for Front Axle Loading
Overweight Trucks Escaping Detection
80%
60%
40%
20%
0%
10
11
12
13
14
15
Screening Weight Limit (x 1,000 lbs)
Woodburn, OR. March 8, 1993
Front Axle Weight. Standard Deviation: 13%

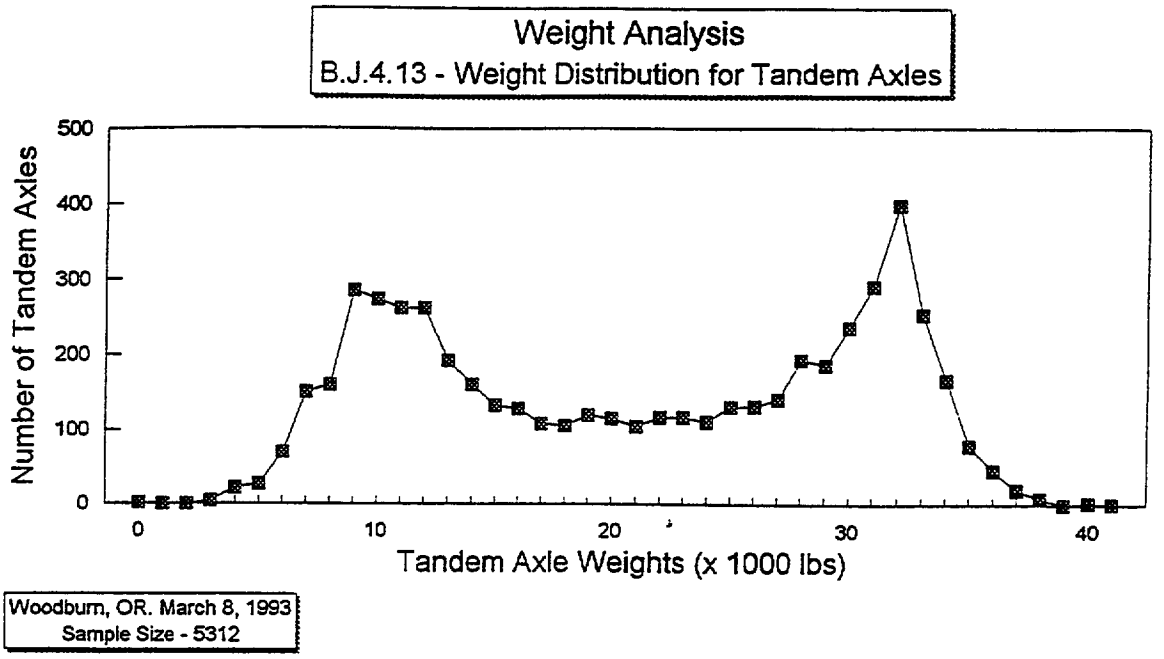

Weight Analysis
B.J.4.8 - Legally Laden Trucks Unnecessarily Stopped for Front Axle Loading
Legal Trucks Unnecessarily Stopped
80%
60%
40%
20%
0%
10
11
12
13
14
15
Screening Weight Limit (x 1,000 lbs)
Woodburn, OR. March 8, 1993
Front Axle Weight. Standard Deviation: 13%

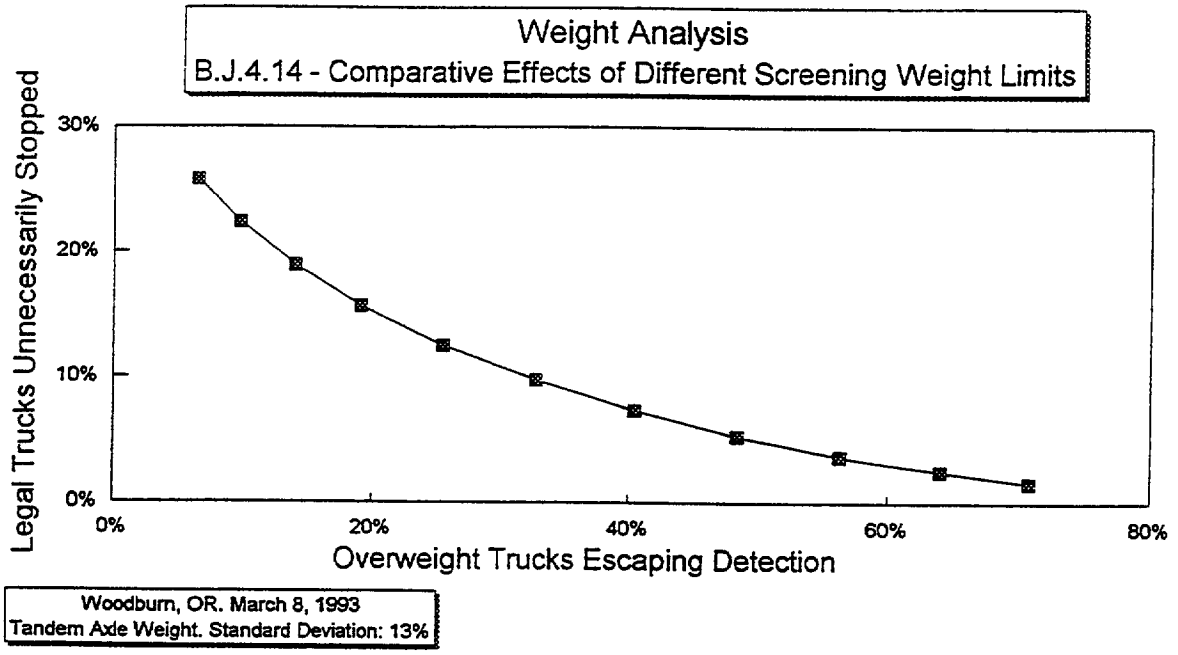

Weight Analysis
B.J.4.9 - Weight Distribution for Single Axles
Number of Single Axles
200
150
100
50
0
0
5
10
15
20
25
30
Single Axle Weights (x 1000 lbs)
Woodburn, OR. March 8, 1993
Sample Size - 2507

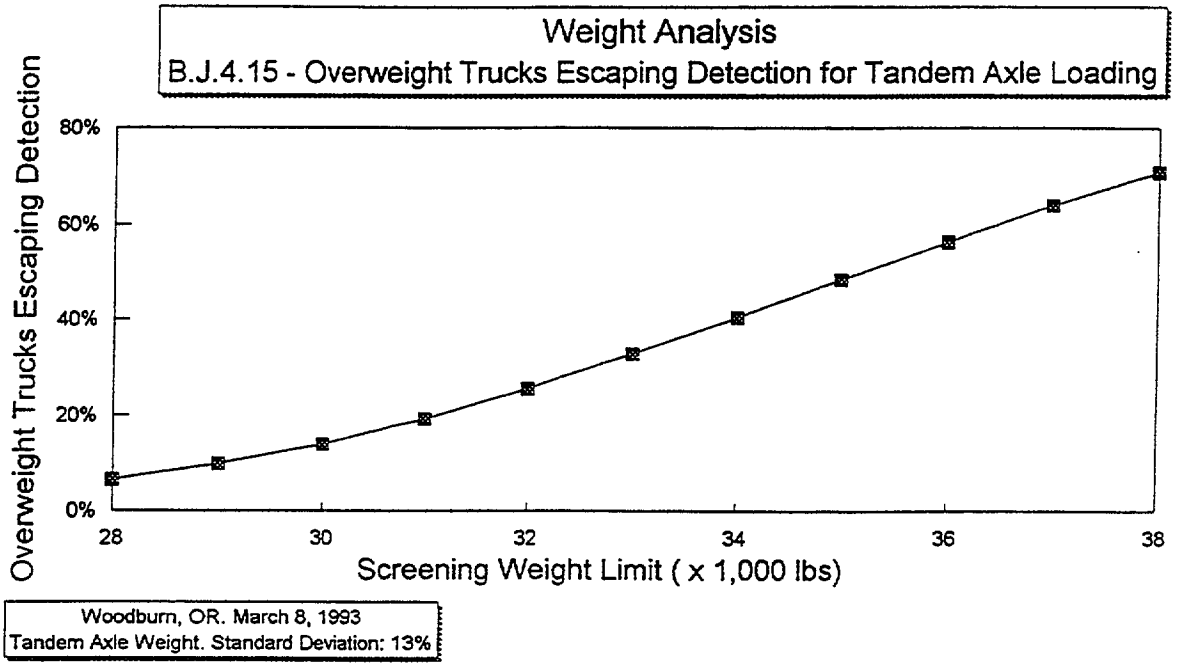

Weight Analysis
B.J.4.10 - Comparative Effects of Different Screening Weight Limits
Legal Trucks Unnecessarily Stopped
40%
30%
20%
10%
0%
0%
20%
40%
60%
80%
100%
Overweight Trucks Escaping Detection
Woodburn, OR. March 8, 1993
Single Axle Weight. Standard Deviation: 13%

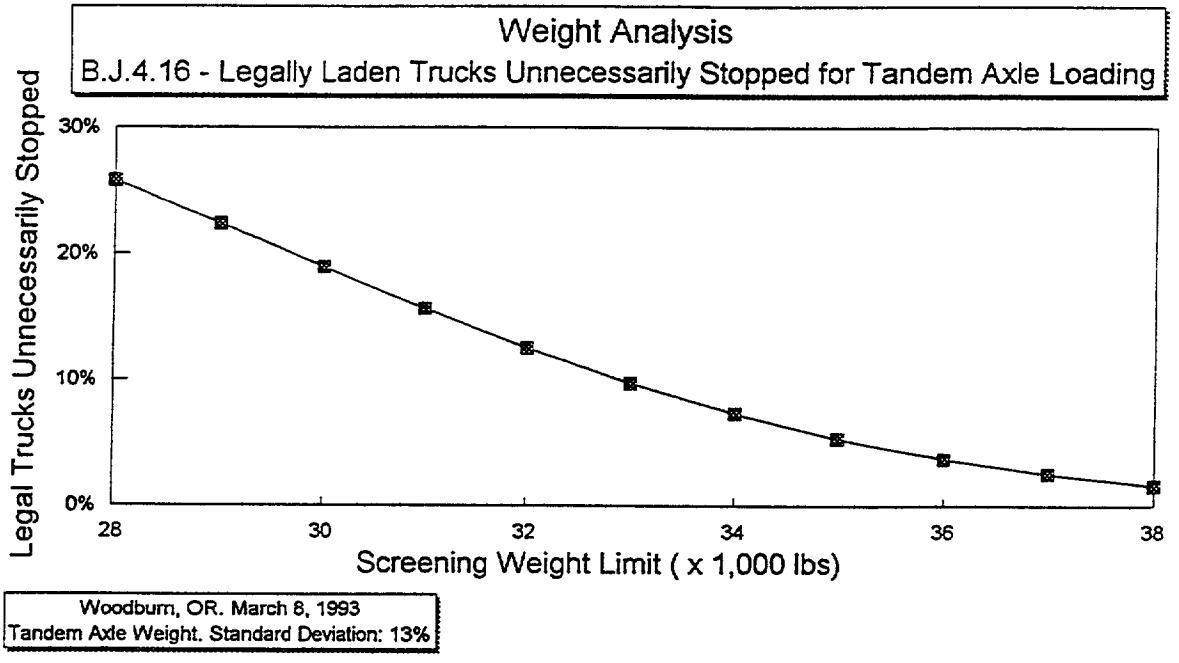

Weight Analysis
B.J.4.11 - Overweight Trucks Escaping Detection for Single Axle Loading
Overweight Trucks Escaping Detection
100%
80%
60%
40%
20%
0%
14
16
18
20
22
24
Screening Weight Limit (x 1,000 lbs)
Woodburn, OR. March 8, 1993
Single Axle Weight. Standard Deviation: 13%

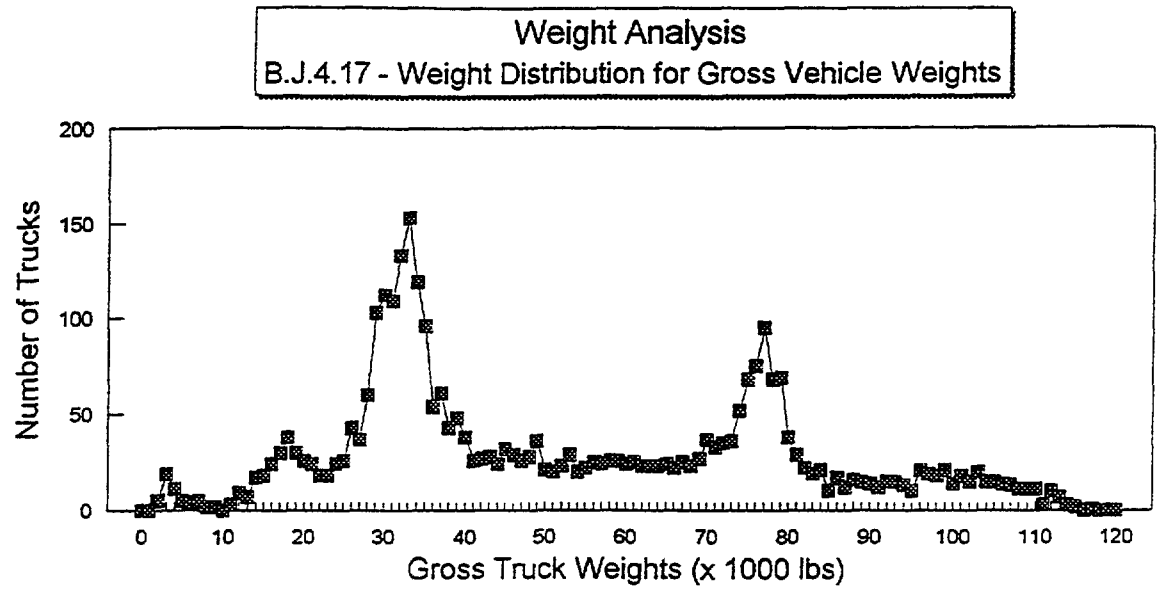

Weight Analysis
B.J.4.12 - Legally Laden Trucks Unnecessarily Stopped for Single Axle Loading
Legal Trucks Unnecessarily Stopped
40%
30%
20%
10%
0%
14
16
18
20
22
24
Screening Weight Limit (x 1,000 lbs)
Woodburn, OR. March 8, 1993
Single Axle Weight. Standard Deviation: 13%

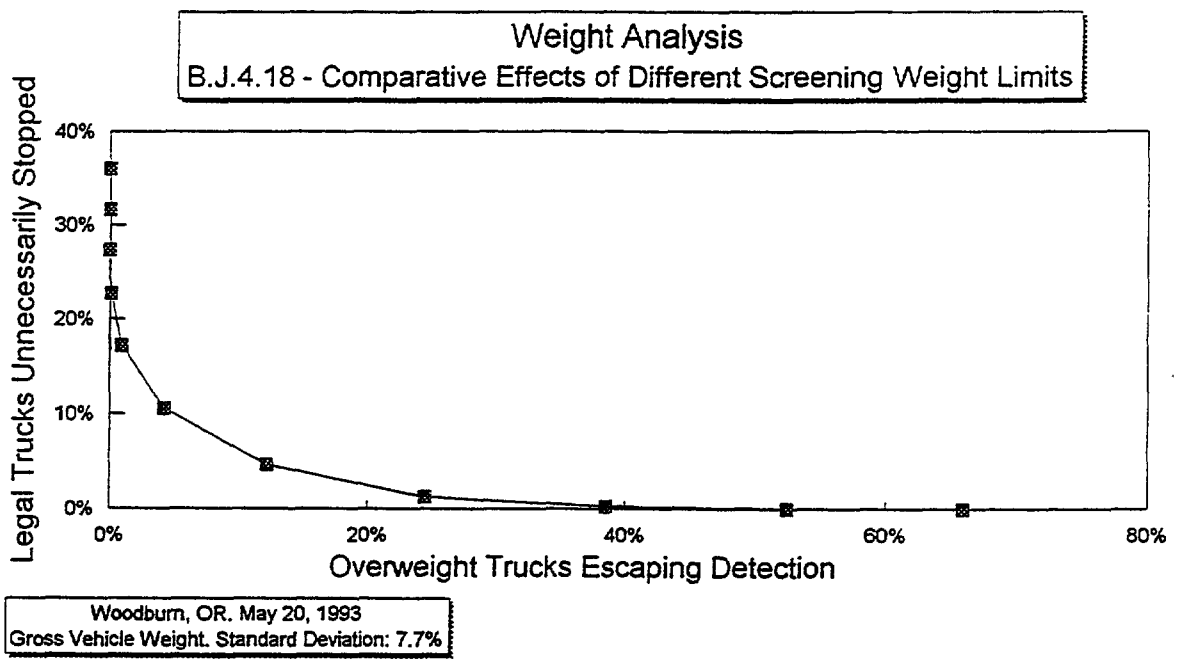

Weight Analysis
B.J.4.13 - Weight Distribution for Tandem Axles
Number of Tandem Axles
500
400
300
200
100
0
0
10
20
30
40
Tandem Axle Weights (x 1000 lbs)
Woodburn, OR. March 8, 1993
Sample Size - 5312

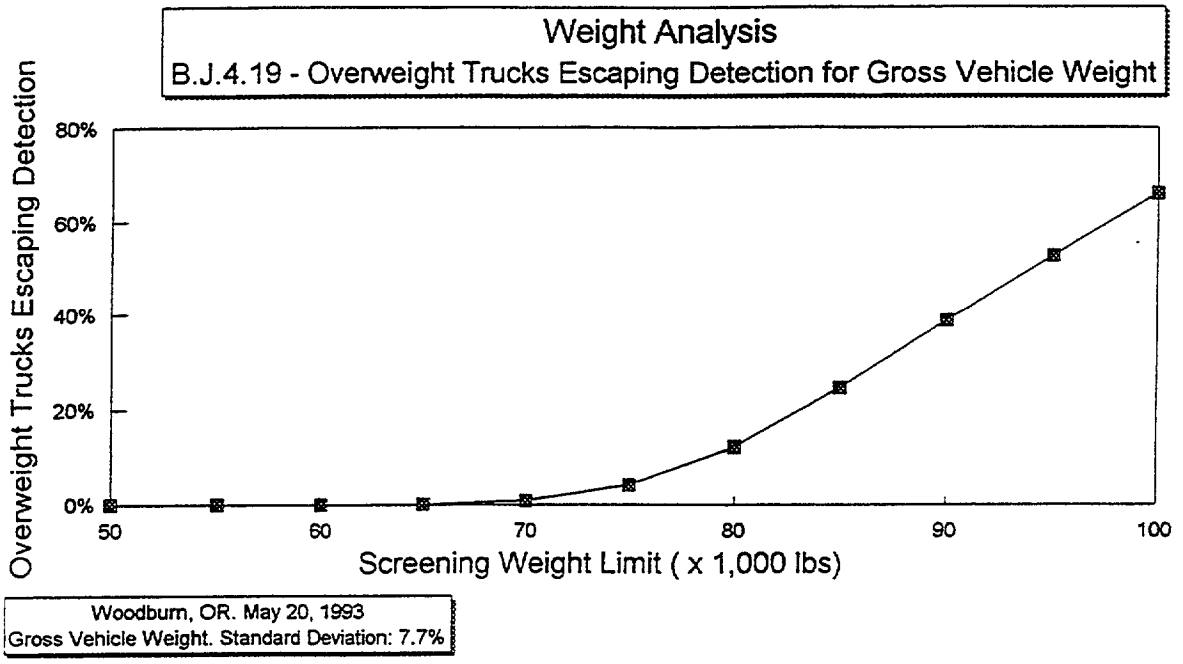

Weight Analysis
B.J.4.14 - Comparative Effects of Different Screening Weight Limits
Legal Trucks Unnecessarily Stopped
30%
20%
10%
0%
0%
20%
40%
60%
80%
Overweight Trucks Escaping Detection
Woodburn, OR. March 8, 1993
Tandem Axle Weight. Standard Deviation: 13%

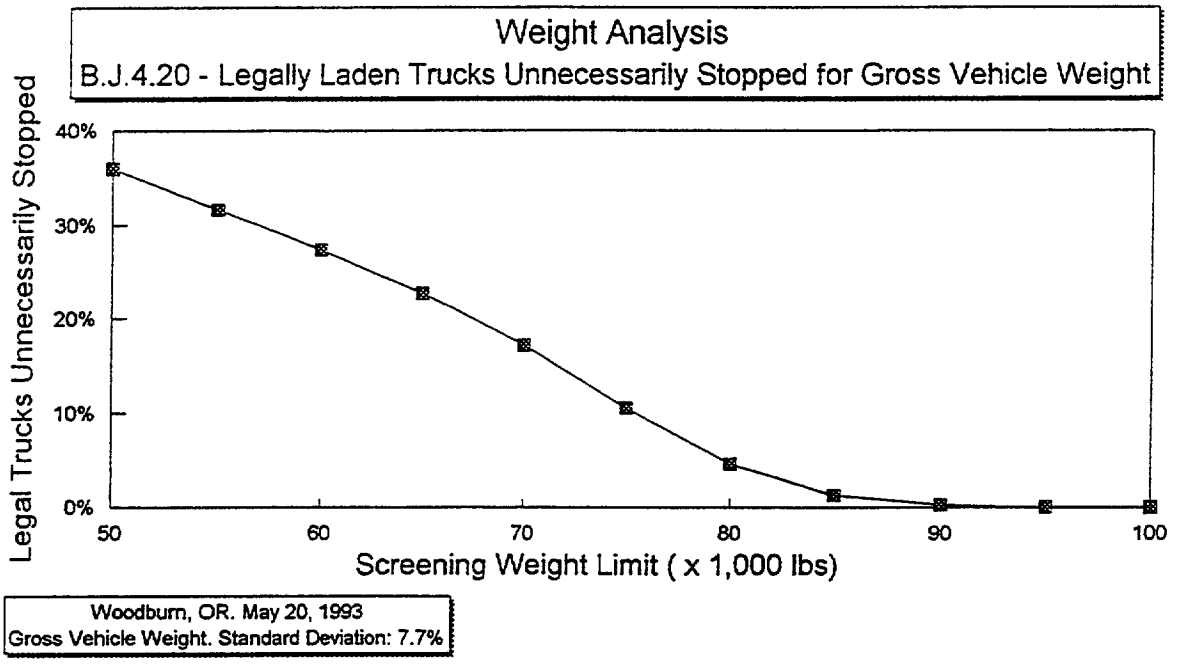

Weight Analysis
B.J.4.15 - Overweight Trucks Escaping Detection for Tandem Axle Loading
Overweight Trucks Escaping Detection
80%
60%
40%
20%
0%
28
30
32
34
36
38
Screening Weight Limit (x 1,000 lbs)
Woodburn, OR. March 8, 1993
Tandem Axle Weight. Standard Deviation: 13%

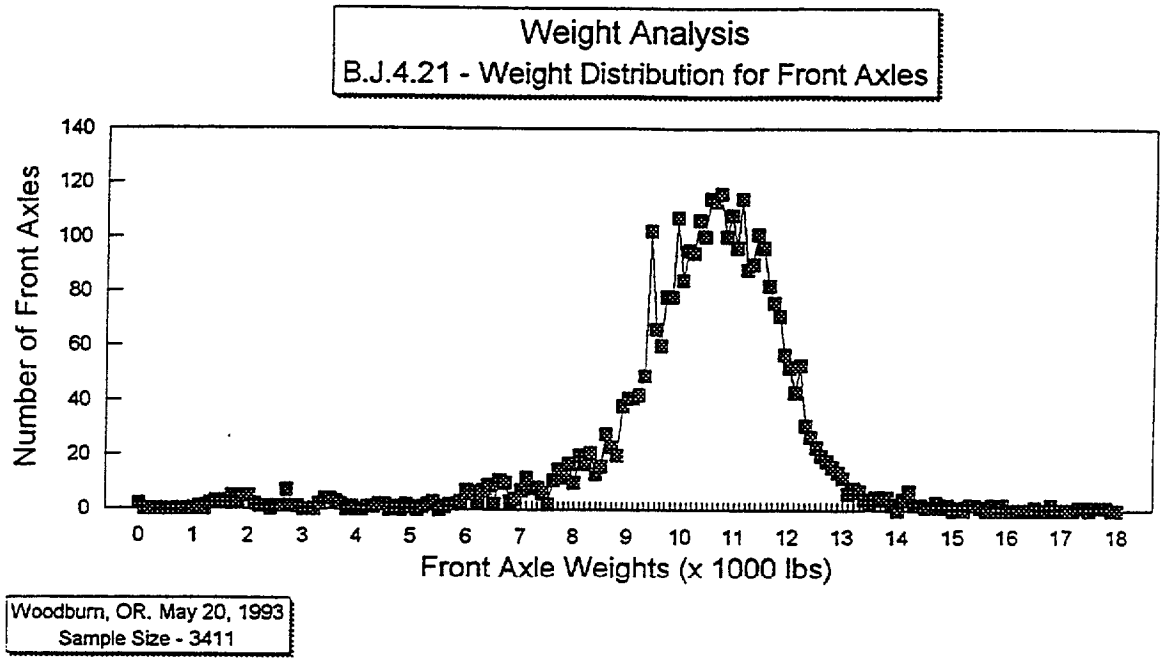

Weight Analysis
B.J.4.16 - Legally Laden Trucks Unnecessarily Stopped for Tandem Axle Loading
Legal Trucks Unnecessarily Stopped
30%
20%
10%
0%
28
30
32
34
36
38
Screening Weight Limit (x 1,000 lbs)
Woodburn, OR. March 8, 1993
Tandem Axle Weight. Standard Deviation: 13%

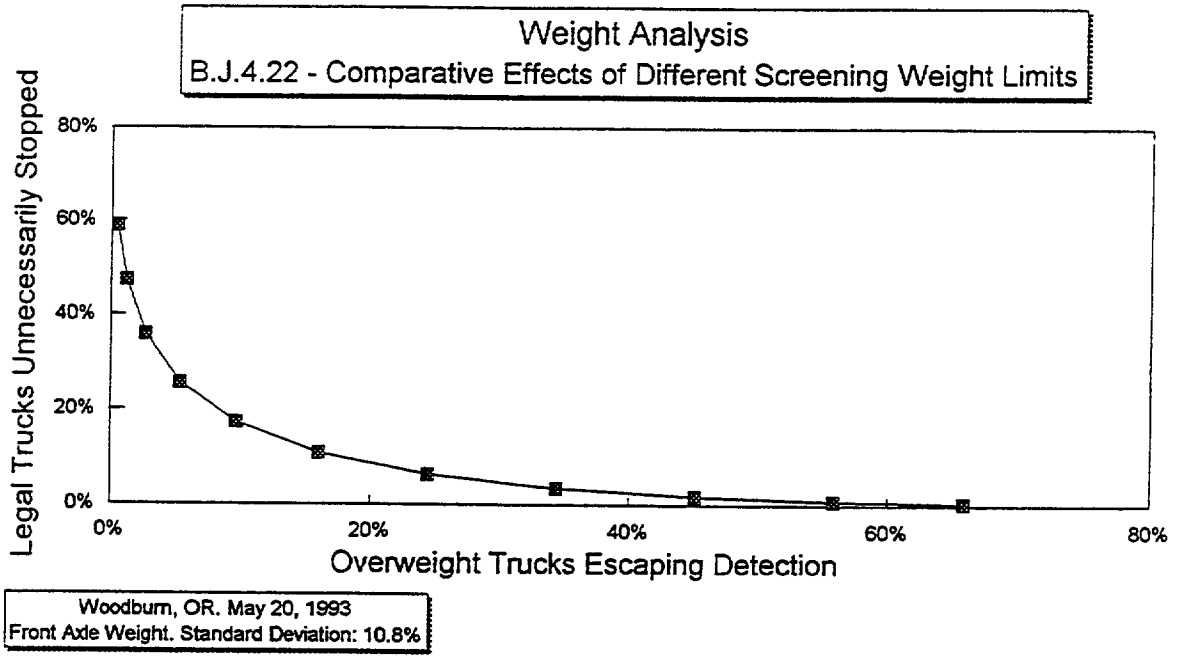

Weight Analysis
B.J.4.17 - Weight Distribution for Gross Vehicle Weights
Number of Trucks
200
150
100
50
0
0
10
20
30
40
50
60
70
80
90
100
110
120
Gross Truck Weights (x 1000 lbs)
Woodburn, OR. May 20, 1993
Sample Size - 3423

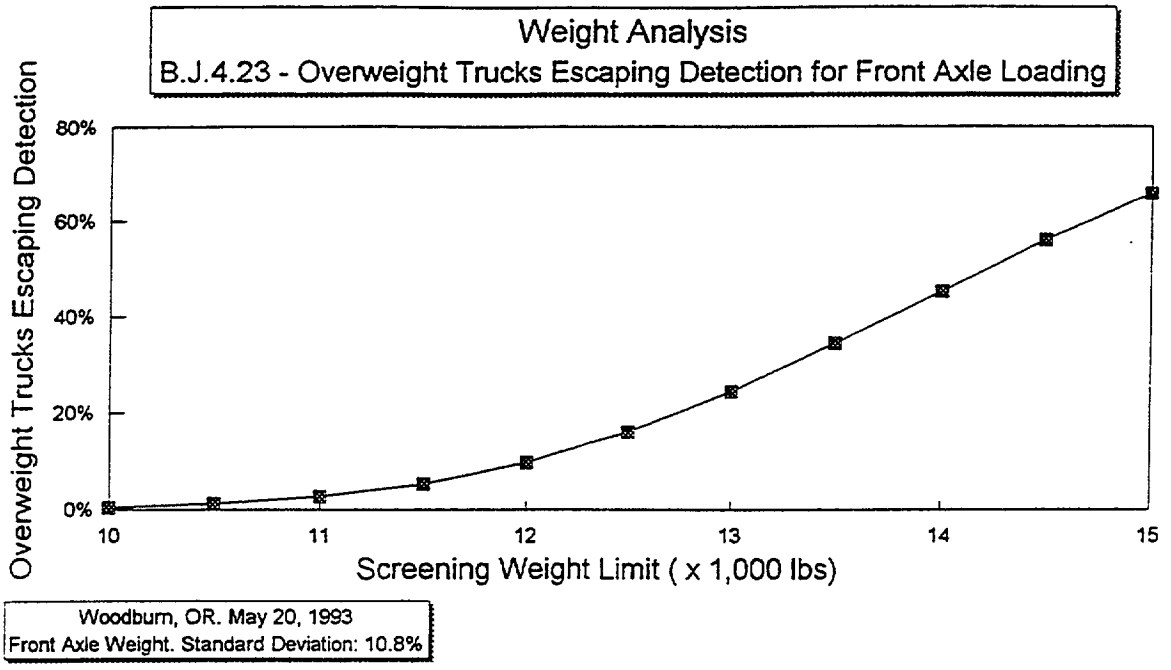

Weight Analysis
B.J.4.18 - Comparative Effects of Different Screening Weight Limits
Legal Trucks Unnecessarily Stopped
40%
30%
20%
10%
0%
0%
20%
40%
60%
80%
Overweight Trucks Escaping Detection
Woodburn, OR. May 20, 1993
Gross Vehicle Weight. Standard Deviation: 7.7%

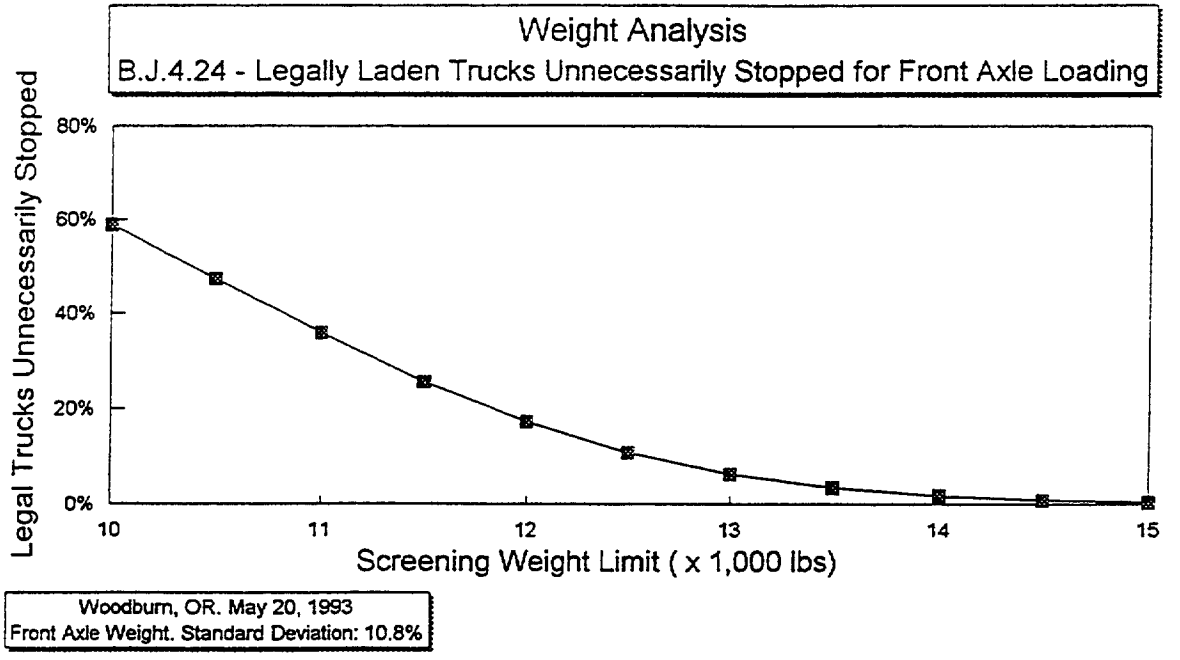

Weight Analysis
B.J.4.19 - Overweight Trucks Escaping Detection for Gross Vehicle Weight
Overweight Trucks Escaping Detection
80%
60%
40%
20%
0%
50
60
70
80
90
100
Screening Weight Limit (x 1,000 lbs)
Woodburn, OR. May 20, 1993
Gross Vehicle Weight. Standard Deviation: 7.7%

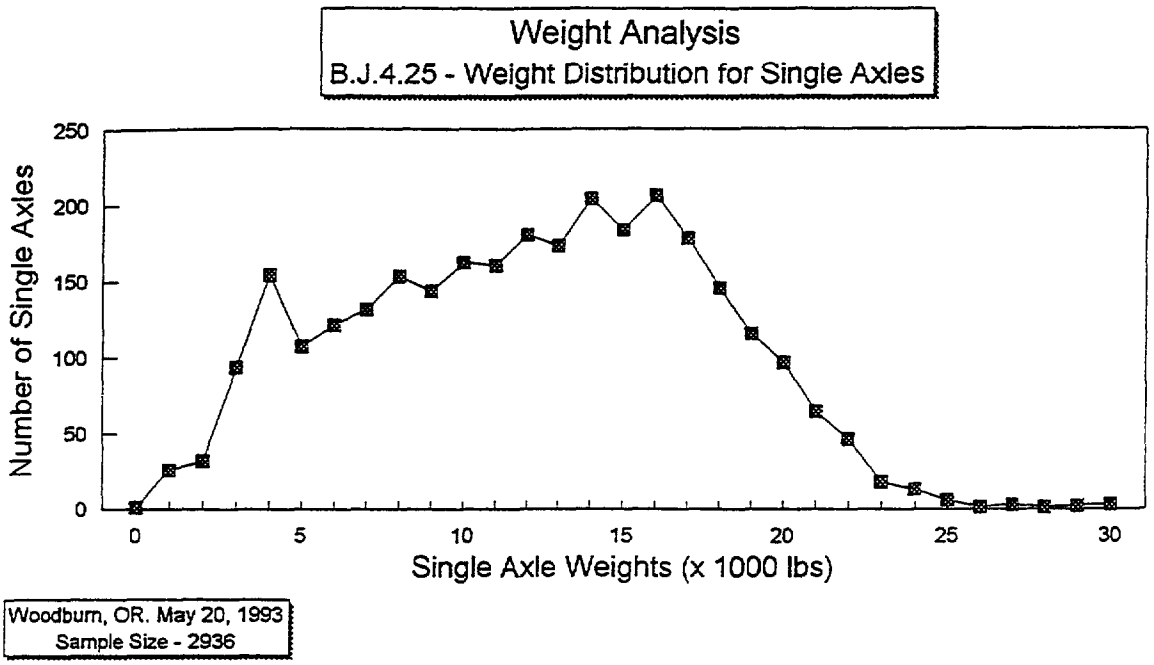

Weight Analysis
B.J.4.20 - Legally Laden Trucks Unnecessarily Stopped for Gross Vehicle Weight
Legal Trucks Unnecessarily Stopped
40%
30%
20%
10%
0%
50
60
70
80
90
100
Screening Weight Limit (x 1,000 lbs)
Woodburn, OR. May 20, 1993
Gross Vehicle Weight. Standard Deviation: 7.7%

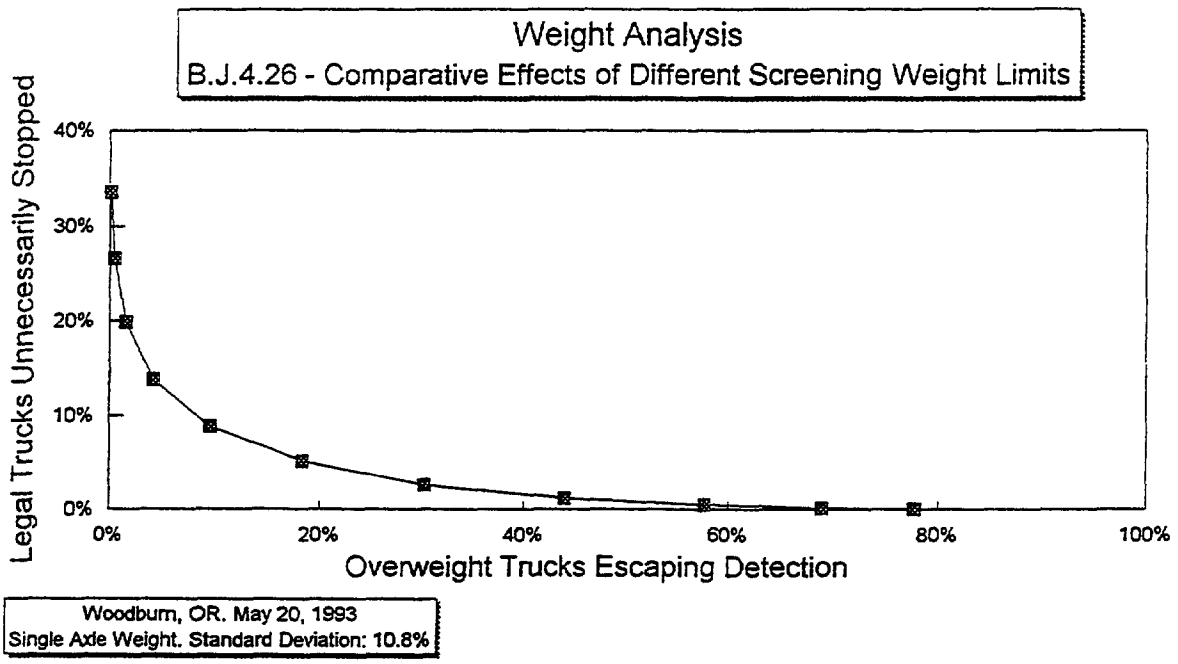

Weight Analysis
B.J.4.21 - Weight Distribution for Front Axles
Number of Front Axles
140
120
100
80
60
40
20
0
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
Front Axle Weights (x 1000 lbs)
Woodburn, OR. May 20, 1993
Sample Size - 3411

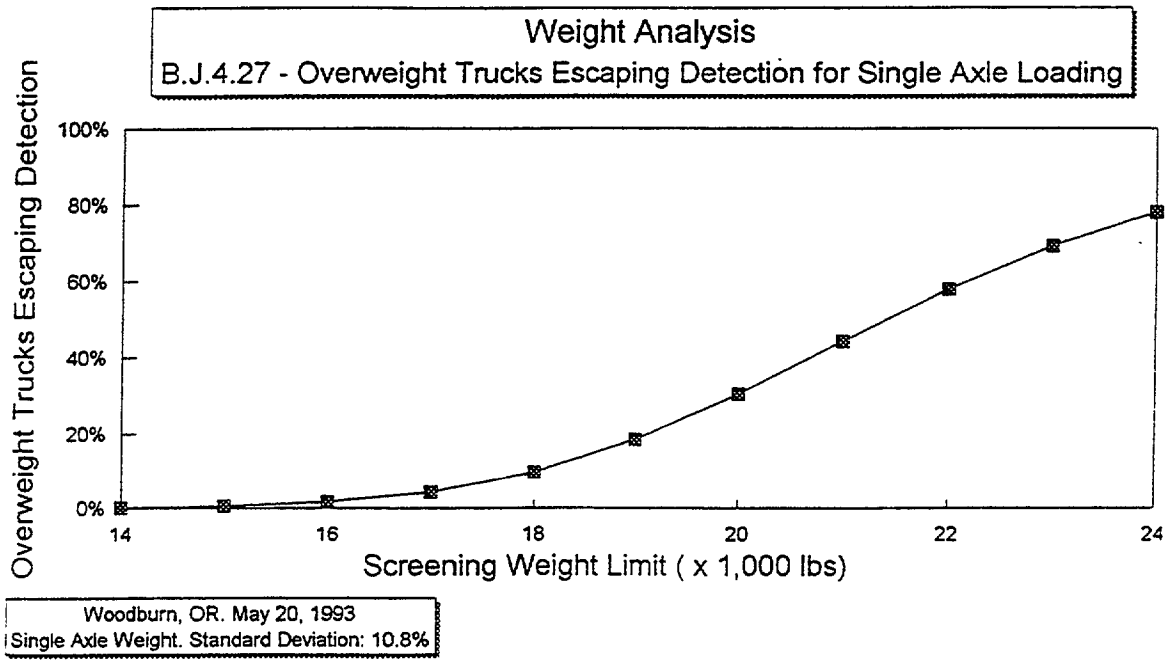

Weight Analysis
B.J.4.22 - Comparative Effects of Different Screening Weight Limits
Legal Trucks Unnecessarily Stopped
80%
60%
40%
20%
0%
0% 20% 40% 60% 80%
Overweight Trucks Escaping Detection
Woodburn, OR. May 20, 1993
Front Axle Weight. Standard Deviation: 10.8%

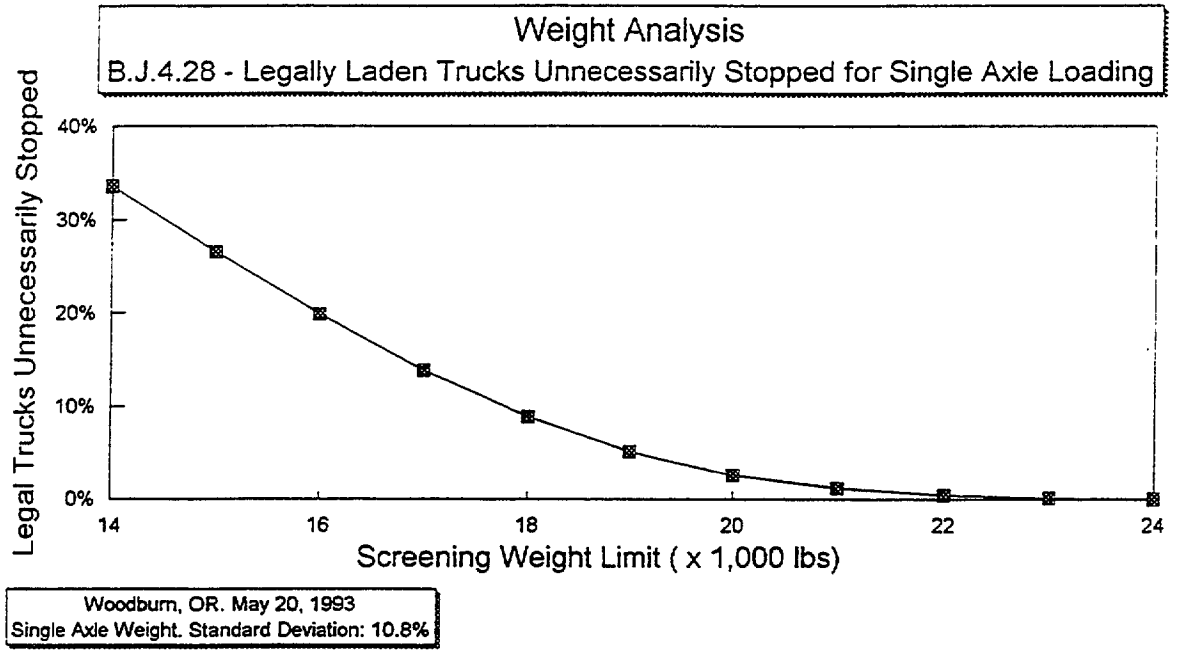

Weight Analysis
B.J.4.23 - Overweight Trucks Escaping Detection for Front Axle Loading
Overweight Trucks Escaping Detection
80%
60%
40%
20%
0%
10
11
12
13
14
15
Screening Weight Limit (x 1,000 lbs)
Woodburn, OR. May 20, 1993
Front Axle Weight. Standard Deviation: 10.8%

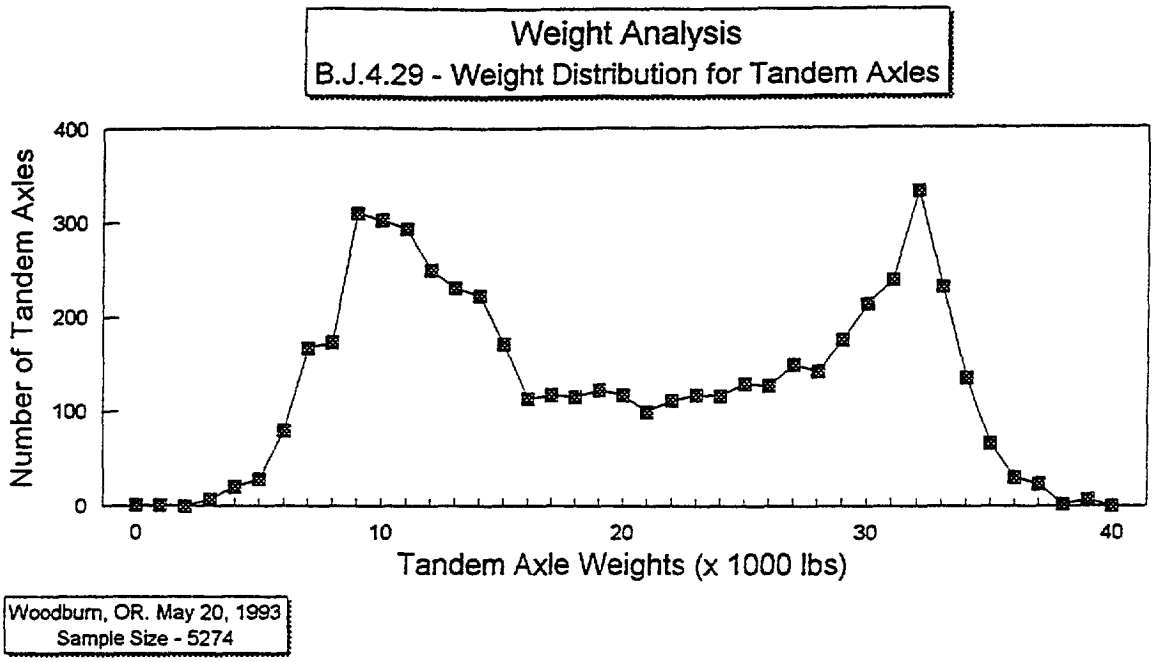

Weight Analysis
B.J.4.24 - Legally Laden Trucks Unnecessarily Stopped for Front Axle Loading
Legal Trucks Unnecessarily Stopped
80%
60%
40%
20%
0%
10
11
12
13
14
15
Screening Weight Limit (x 1,000 lbs)
Woodburn, OR. May 20, 1993
Front Axle Weight. Standard Deviation: 10.8%

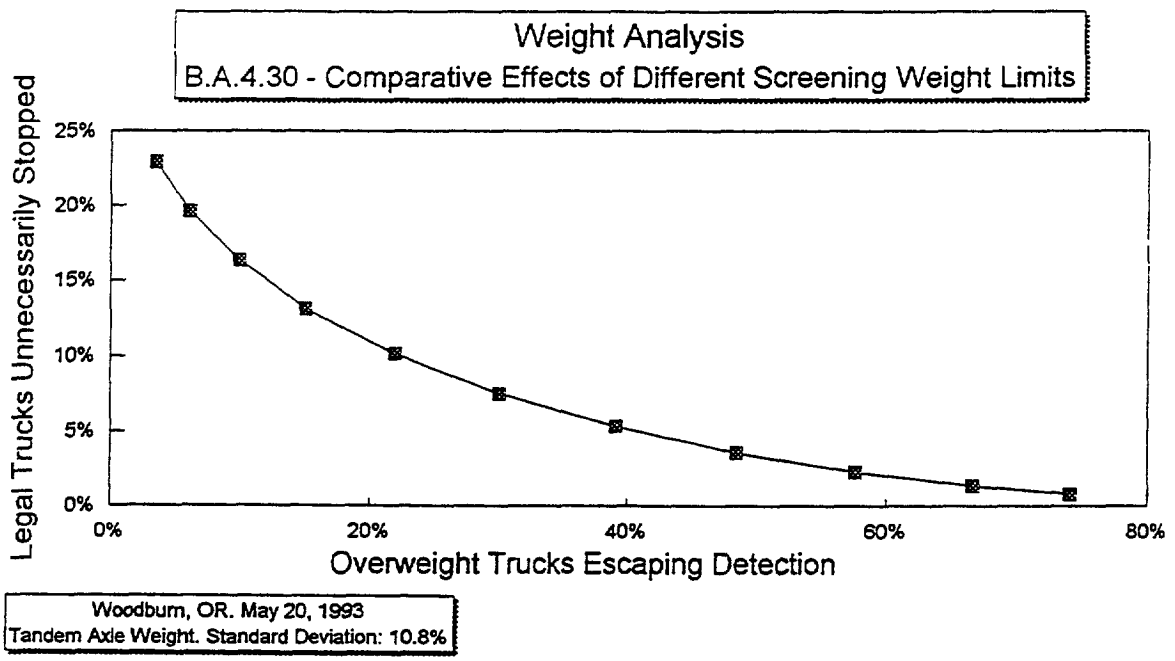

Weight Analysis
B.J.4.25 - Weight Distribution for Single Axles
Number of Single Axles
250
200
150
100
50
0
0
5
10
15
20
25
30
Single Axle Weights (x 1000 lbs)
Woodburn, OR. May 20, 1993
Sample Size - 2936

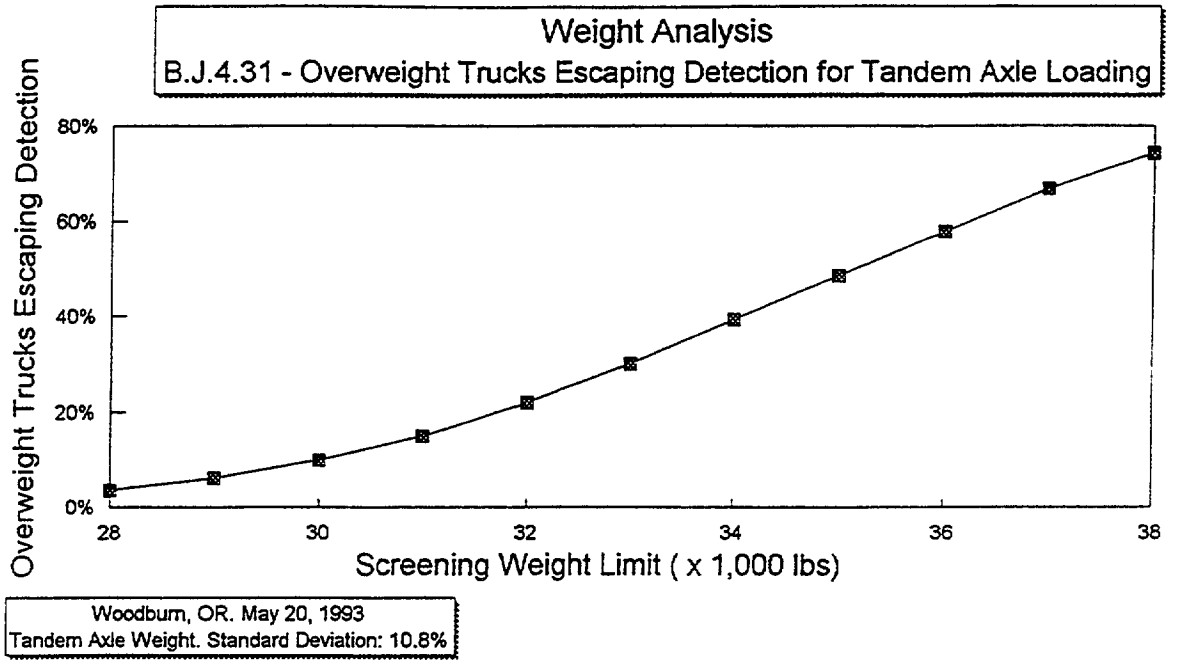

Weight Analysis
B.J.4.26 - Comparative Effects of Different Screening Weight Limits
Legal Trucks Unnecessarily Stopped
40%
30%
20%
10%
0%
0%
20%
40%
60%
80%
100%
Overweight Trucks Escaping Detection
Woodburn, OR. May 20, 1993
Single Axle Weight. Standard Deviation: 10.8%

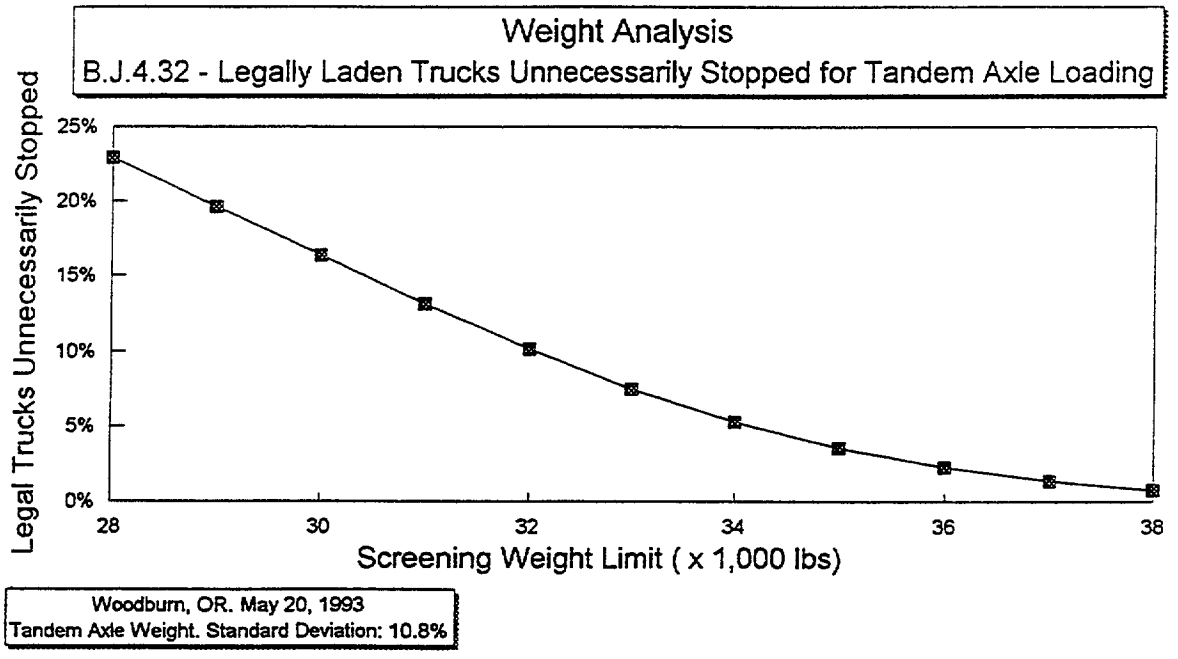

Weight Analysis
B.J.4.27 - Overweight Trucks Escaping Detection for Single Axle Loading
Overweight Trucks Escaping Detection
100%
80%
60%
40%
20%
0%
14
16
18
20
22
24
Screening Weight Limit (x 1,000 lbs)
Woodburn, OR. May 20, 1993
Single Axle Weight. Standard Deviation: 10.8%


Weight Analysis
B.J.4.28 - Legally Laden Trucks Unnecessarily Stopped for Single Axle Loading
Legal Trucks Unnecessarily Stopped
40%
30%
20%
10%
0%
14
16
18
20
22
24
Screening Weight Limit (x 1,000 lbs)
Woodburn, OR. May 20, 1993
Single Axle Weight. Standard Deviation: 10.8%

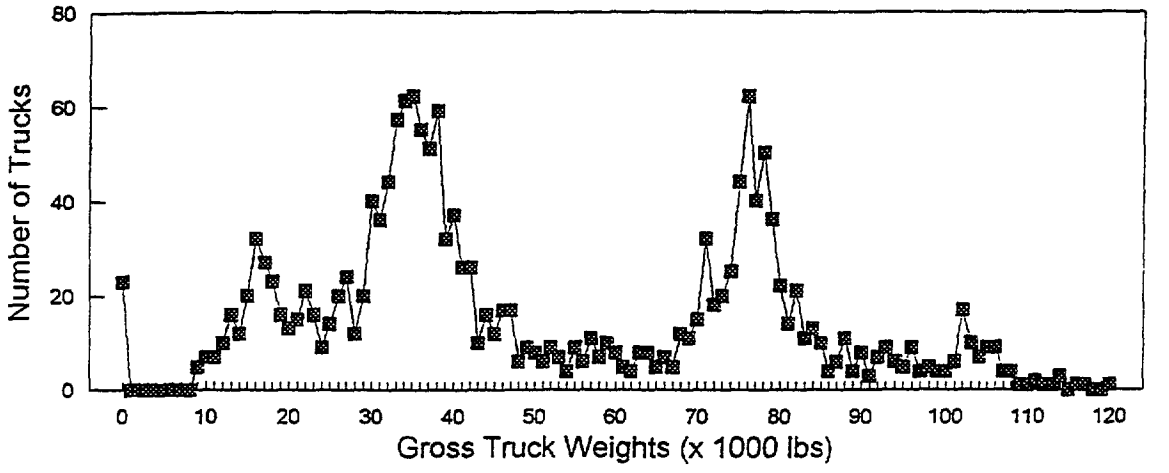

Weight Analysis
B.J.4.29 - Weight Distribution for Tandem Axles
Number of Tandem Axles
400
300
200
100
0
0
10
20
30
40
Tandem Axle Weights (x 1000 lbs)
Woodburn, OR. May 20, 1993
Sample Size - 5274


Weight Analysis
B.A.4.30 - Comparative Effects of Different Screening Weight Limits
Legal Trucks Unnecessarily Stopped
25%
20%
15%
10%
5%
0%
0%
20%
40%
60%
80%
Overweight Trucks Escaping Detection
Woodburn, OR. May 20, 1993
Tandem Axle Weight. Standard Deviation: 10.8%


Weight Analysis
B.J.4.31 - Overweight Trucks Escaping Detection for Tandem Axle Loading
Overweight Trucks Escaping Detection
80%
60%
40%
20%
0%
28
30
32
34
36
38
Screening Weight Limit (x 1,000 lbs)
Woodburn, OR. May 20, 1993
Tandem Axle Weight. Standard Deviation: 10.8%

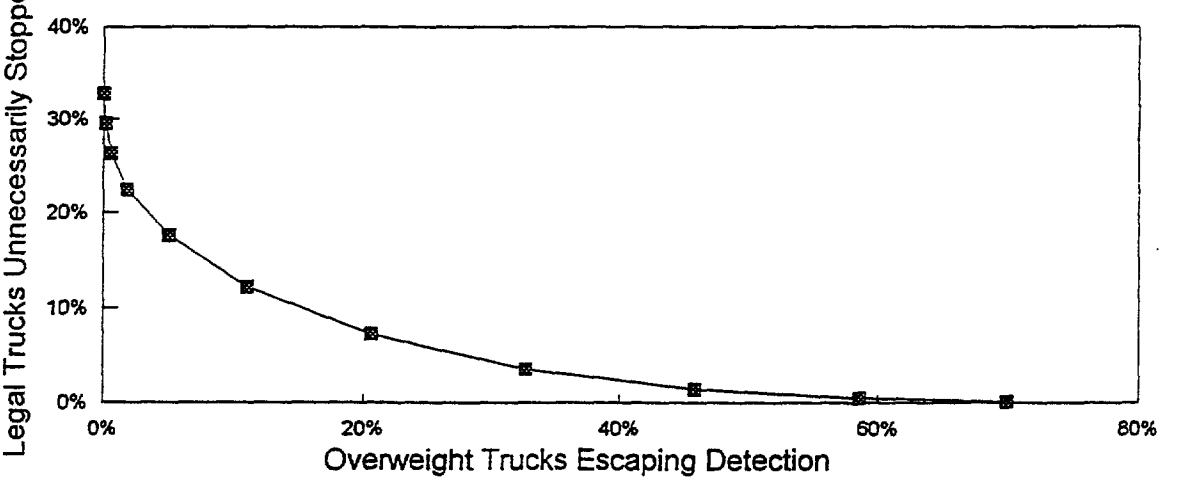

Weight Analysis
B.J.4.32 - Legally Laden Trucks Unnecessarily Stopped for Tandem Axle Loading
Legal Trucks Unnecessarily Stopped
25%
20%
15%
10%
5%
0%
28
30
32
34
36
38
Screening Weight Limit (x 1,000 lbs)
Woodburn, OR. May 20, 1993
Tandem Axle Weight. Standard Deviation: 10.8%

Weight Analysis
B.M.4.1 - Weight Distribution for Gross Vehicle Weights

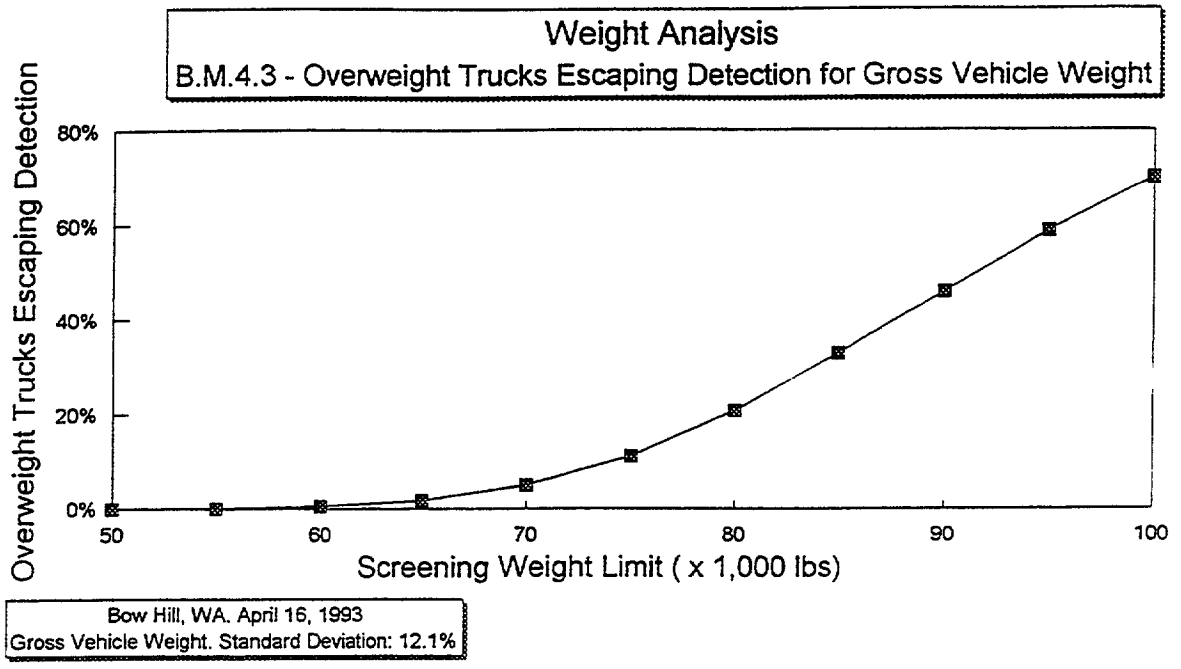


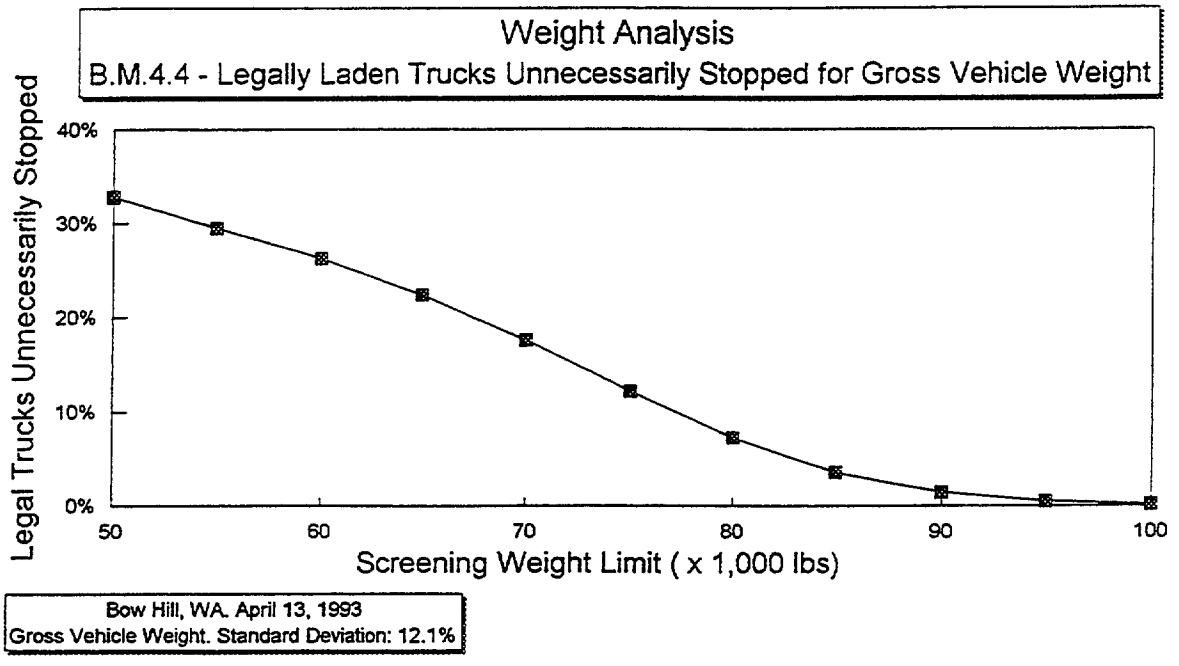
Bow Hill, WA. April 13, 1993
Sample Size - 1785

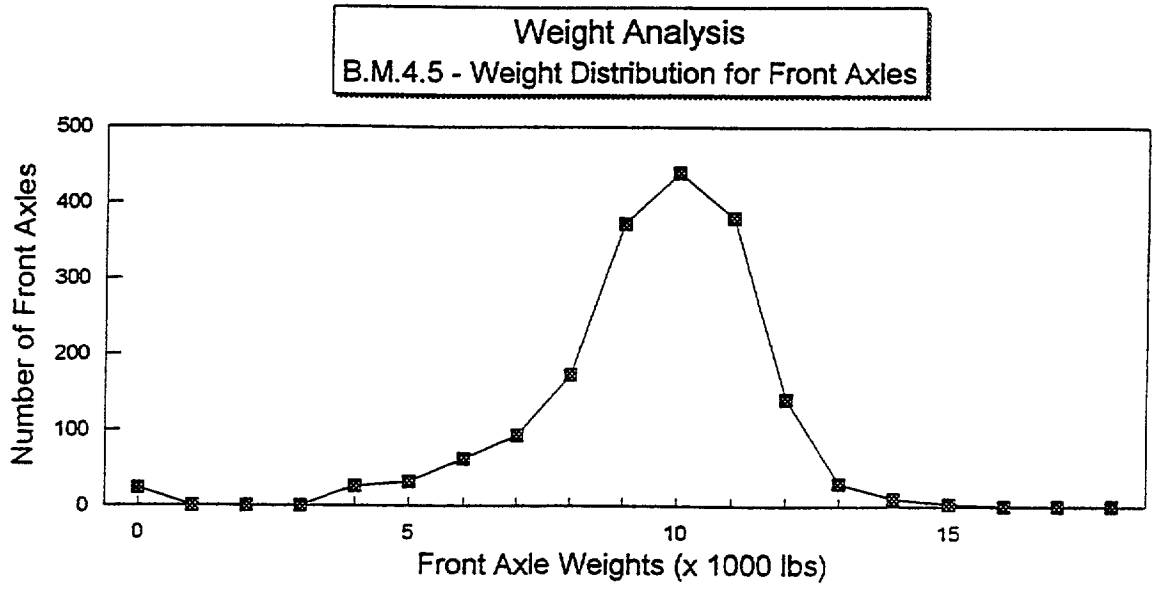
Weight Analysis
B.M.4.2 - Comparative Effects of Different Screening Weight Limits

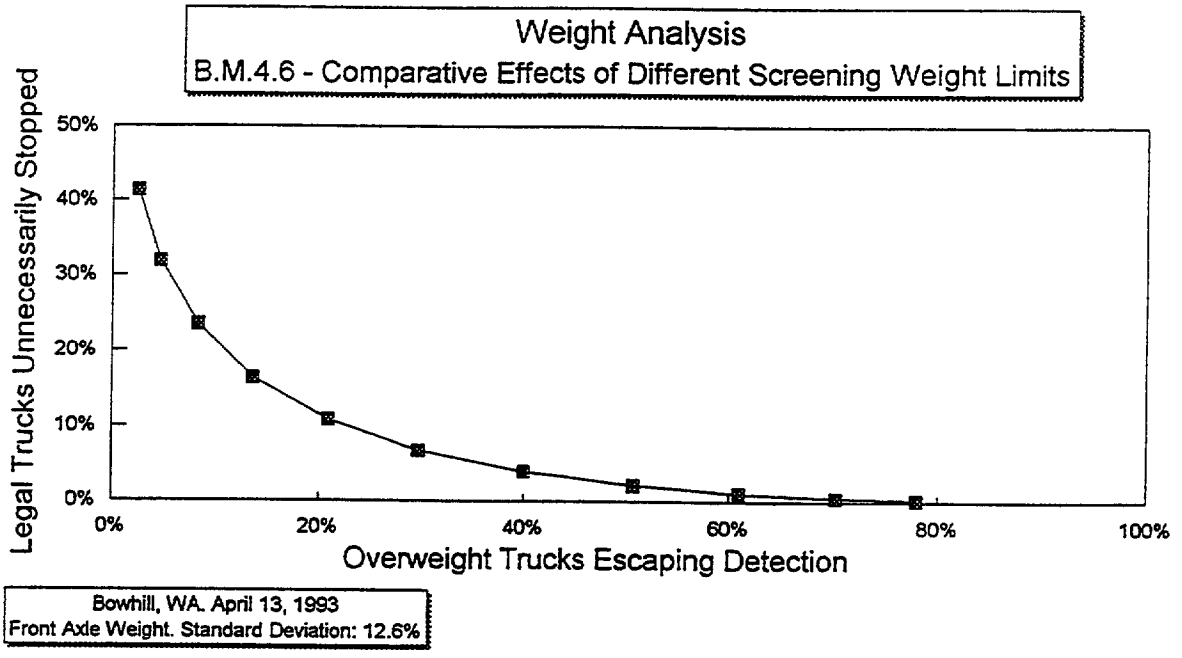


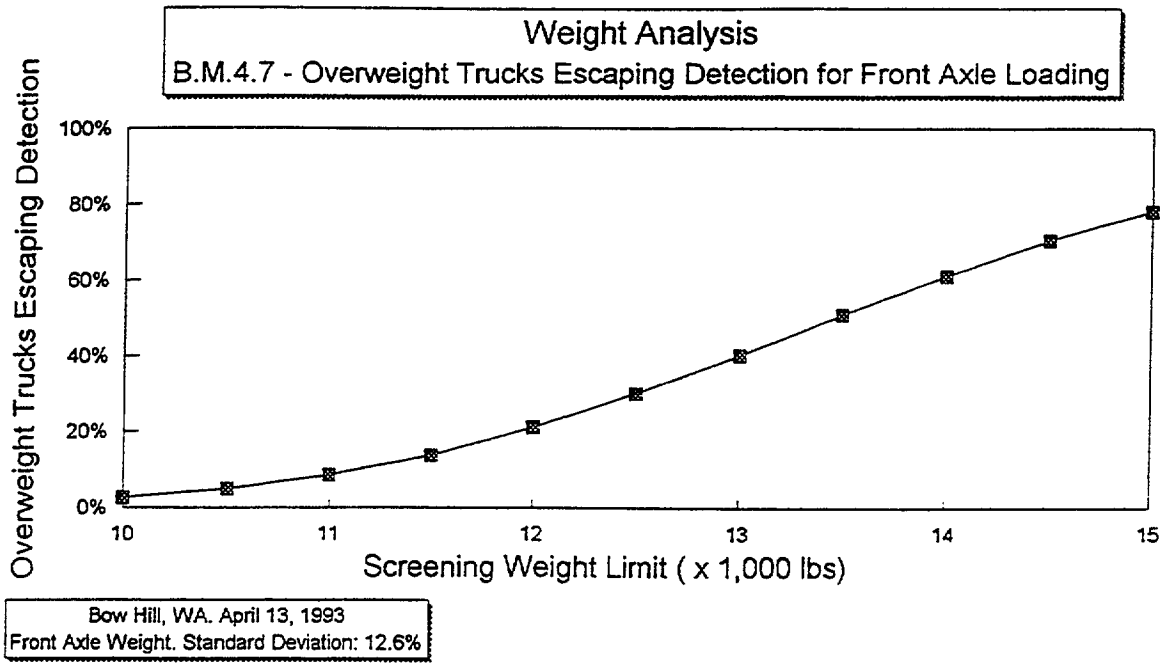
Bow Hill, WA. April 16, 1993
Gross Vehicle Weight. Standard Deviation: 12.1%

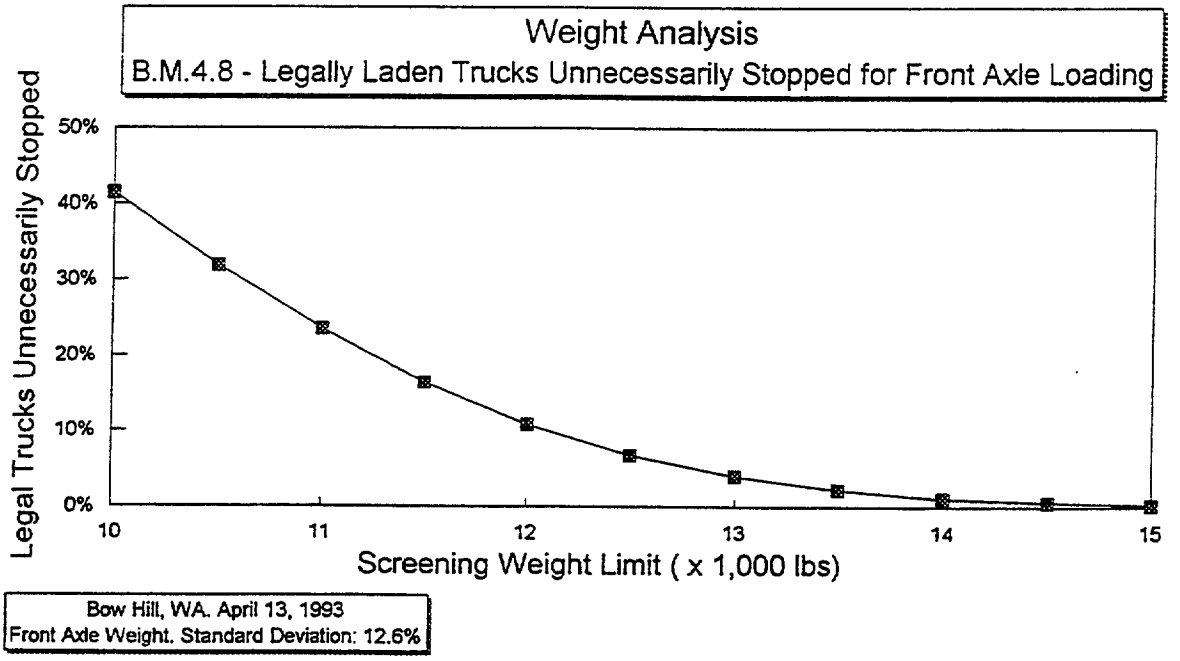

Weight Analysis
B.M.4.3 - Overweight Trucks Escaping Detection for Gross Vehicle Weight
Overweight Trucks Escaping Detection
80%
60%
40%
20%
0%
50
60
70
80
90
100
Screening Weight Limit (x 1,000 lbs)
Bow Hill, WA. April 16, 1993
Gross Vehicle Weight. Standard Deviation: 12.1%

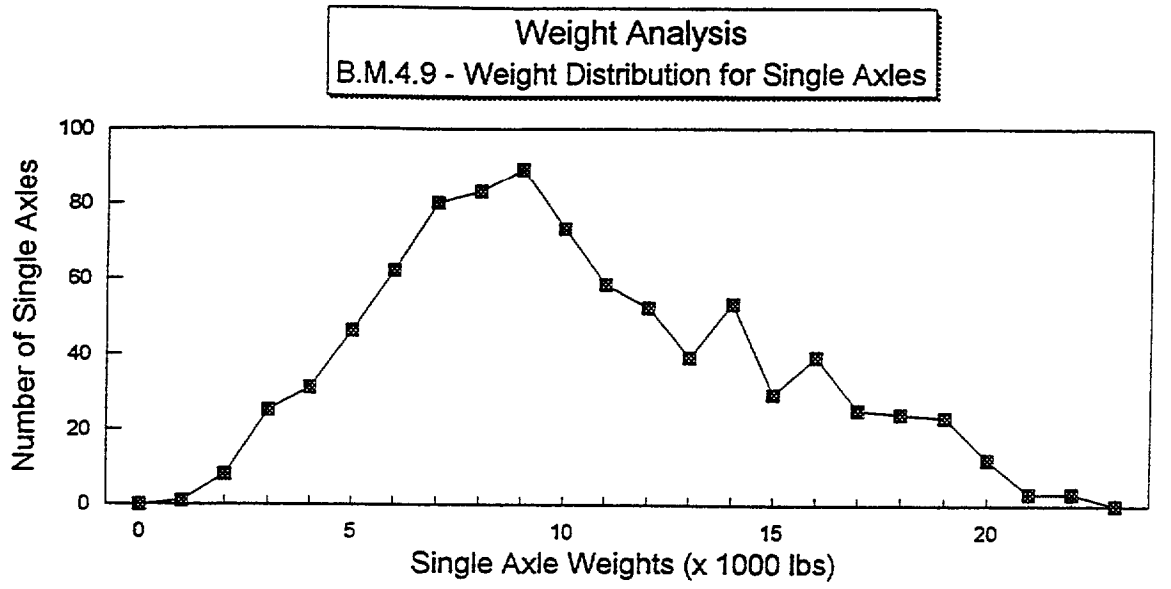

Weight Analysis
B.M.4.4 - Legally Laden Trucks Unnecessarily Stopped for Gross Vehicle Weight
Legal Trucks Unnecessarily Stopped
40%
30%
20%
10%
0%
50
60
70
80
90
100
Screening Weight Limit (x 1,000 lbs)
Bow Hill, WA. April 13, 1993
Gross Vehicle Weight. Standard Deviation: 12.1%

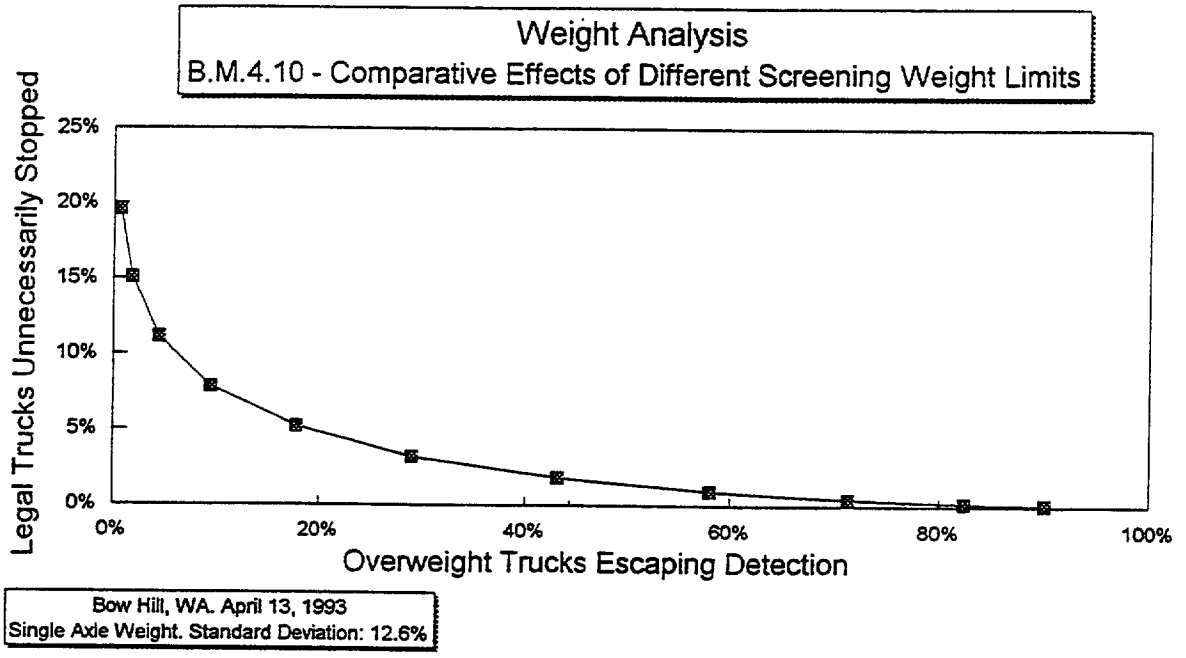

Weight Analysis
B.M.4.5 - Weight Distribution for Front Axles
Number of Front Axles
500
400
300
200
100
0
0
5
10
15
Front Axle Weights (x 1000 lbs)
Bow Hill, WA. April 13, 1993
Sample Size - 1785

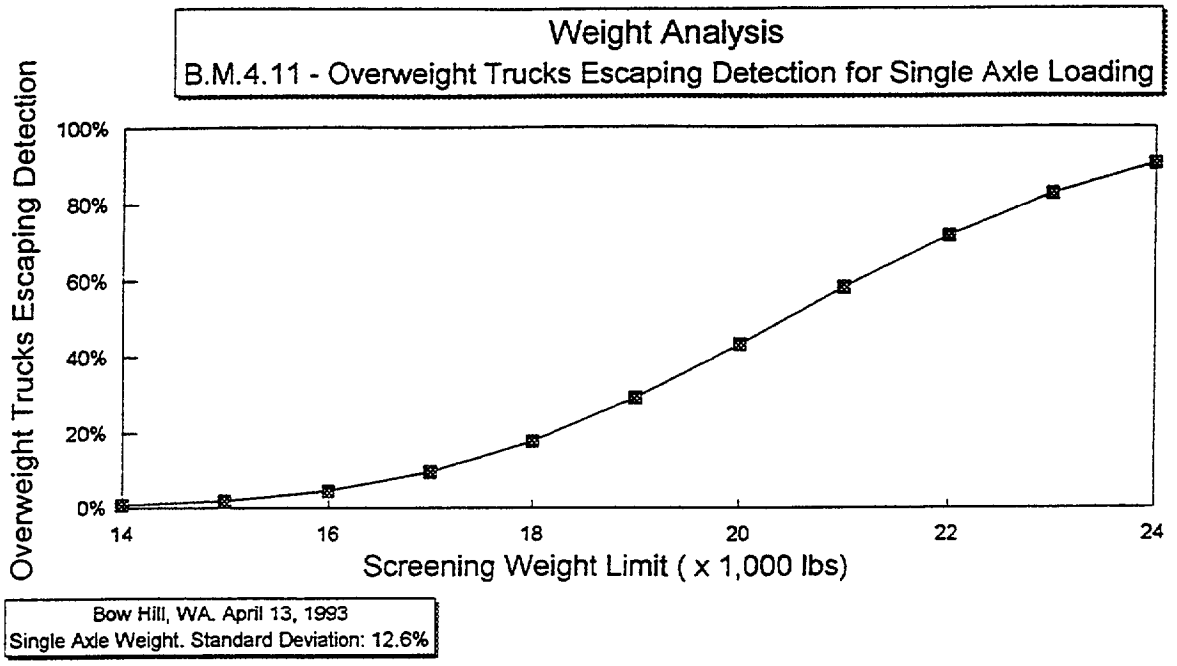

Weight Analysis
B.M.4.6 - Comparative Effects of Different Screening Weight Limits
Legal Trucks Unnecessarily Stopped
50%
40%
30%
20%
10%
0%
0%
20%
40%
60%
80%
100%
Overweight Trucks Escaping Detection
Bowhill, WA. April 13, 1993
Front Axle Weight. Standard Deviation: 12.6%

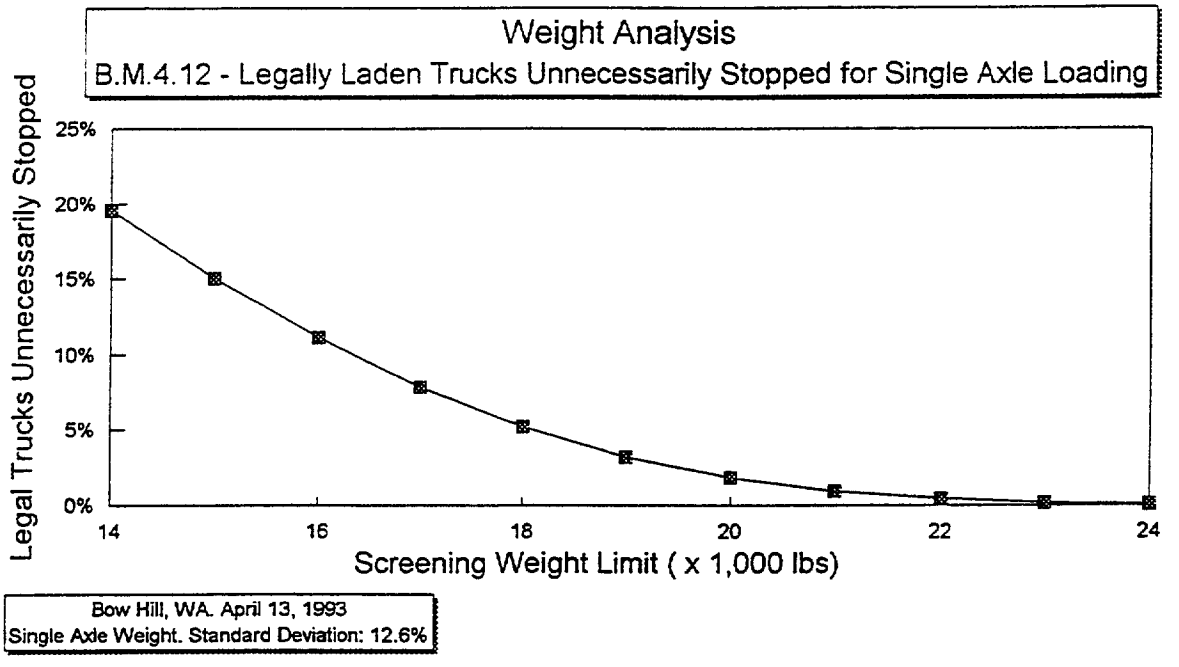

Weight Analysis
B.M.4.7 - Overweight Trucks Escaping Detection for Front Axle Loading
Overweight Trucks Escaping Detection
100%
80%
60%
40%
20%
0%
10
11
12
13
14
15
Screening Weight Limit (x 1,000 lbs)
Bow Hill, WA. April 13, 1993
Front Axle Weight. Standard Deviation: 12.6%

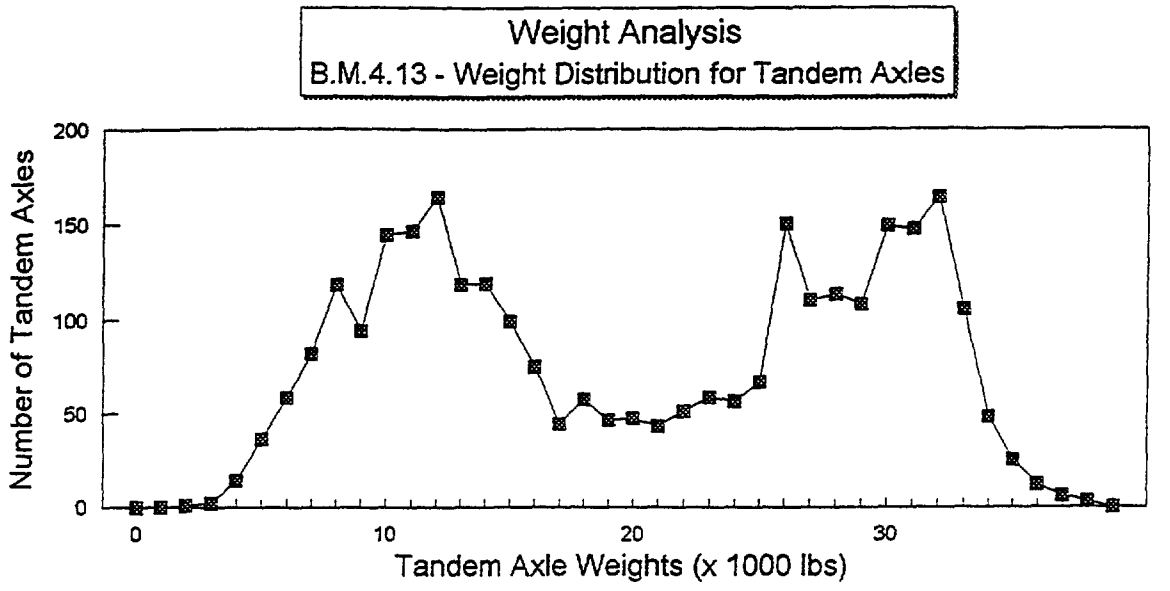

Weight Analysis
B.M.4.8 - Legally Laden Trucks Unnecessarily Stopped for Front Axle Loading
Legal Trucks Unnecessarily Stopped
50%
40%
30%
20%
10%
0%
10
11
12
13
14
15
Screening Weight Limit (x 1,000 lbs)
Bow Hill, WA. April 13, 1993
Front Axle Weight. Standard Deviation: 12.6%

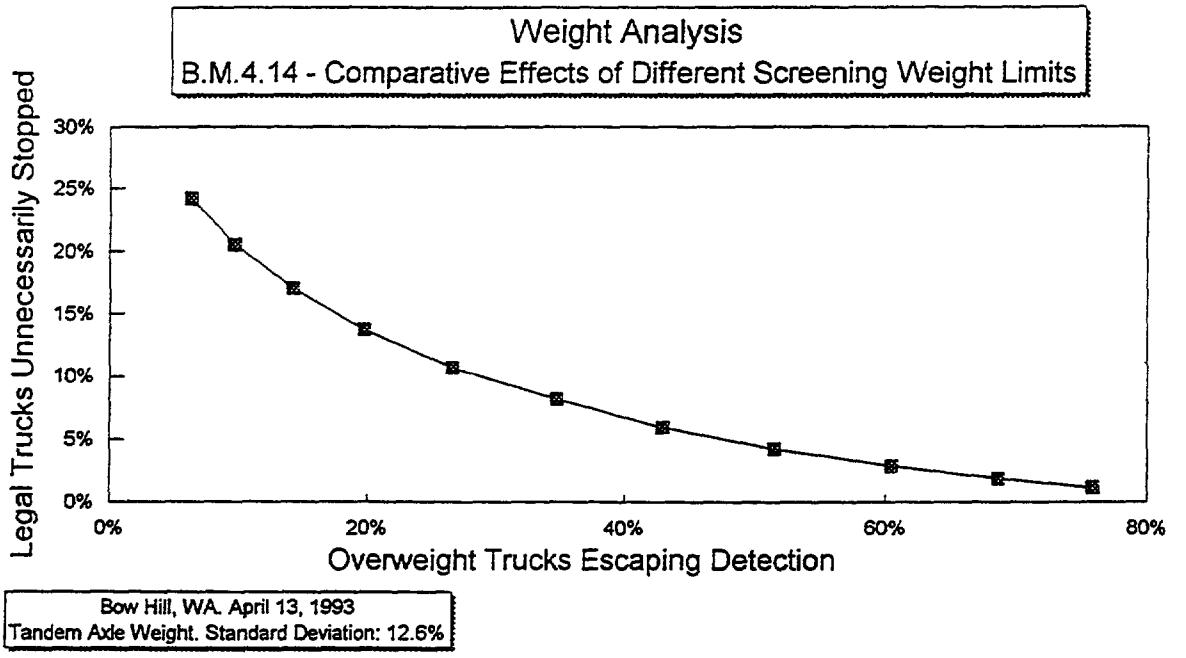

Weight Analysis
B.M.4.9 - Weight Distribution for Single Axles
Number of Single Axles
100
80
60
40
20
0
0
5
10
15
20
Single Axle Weights (x 1000 lbs)
Bow Hill, WA. April 13, 1993
Sample Size - 858

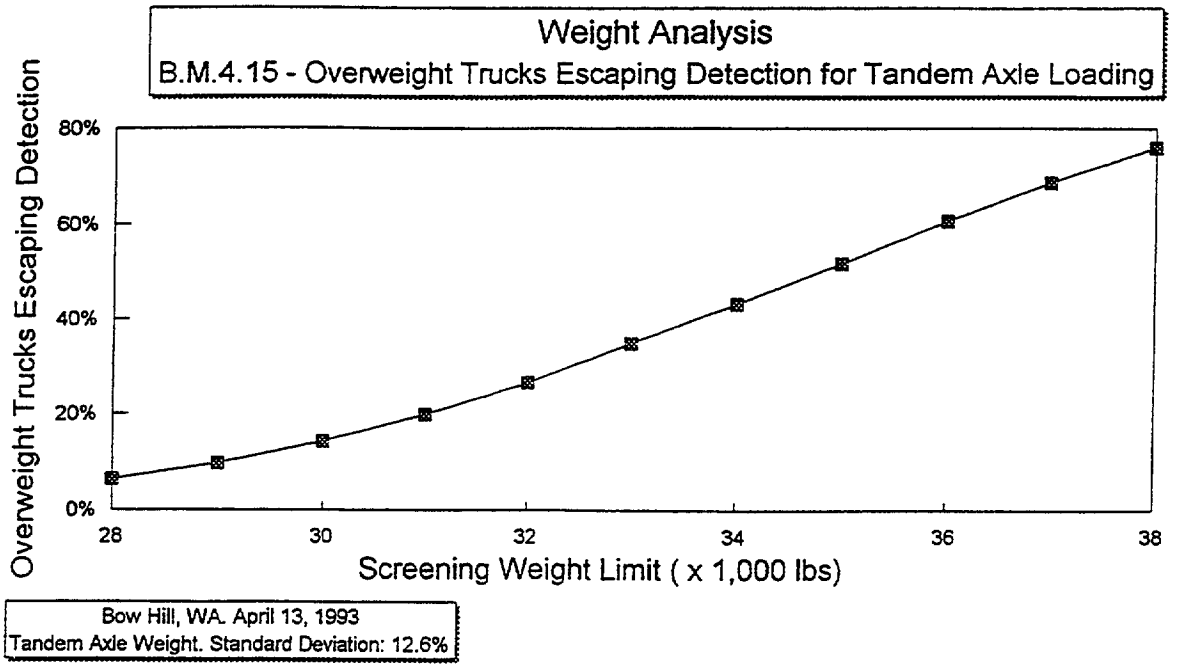

Weight Analysis
B.M.4.10 - Comparative Effects of Different Screening Weight Limits
Legal Trucks Unnecessarily Stopped
25%
20%
15%
10%
5%
0%
0%
20%
40%
60%
80%
100%
Overweight Trucks Escaping Detection
Bow Hill, WA. April 13, 1993
Single Axle Weight. Standard Deviation: 12.6%

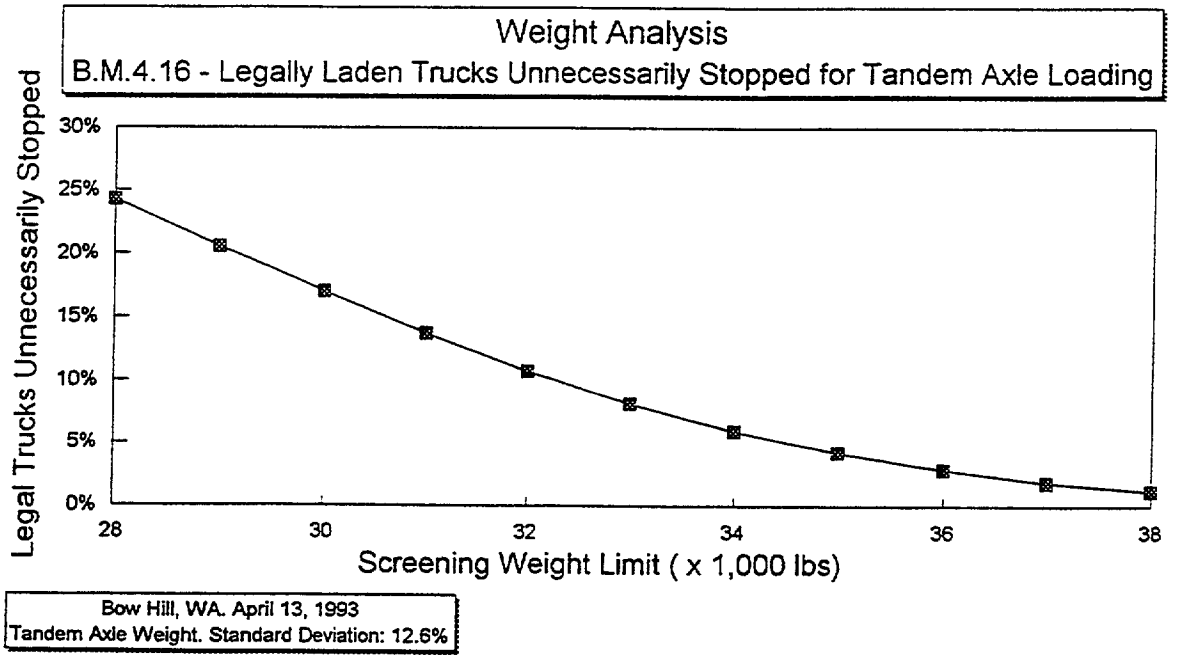

Weight Analysis
B.M.4.11 - Overweight Trucks Escaping Detection for Single Axle Loading
Overweight Trucks Escaping Detection
100%
80%
60%
40%
20%
0%
14
16
18
20
22
24
Screening Weight Limit (x 1,000 lbs)
Bow Hill, WA. April 13, 1993
Single Axle Weight. Standard Deviation: 12.6%

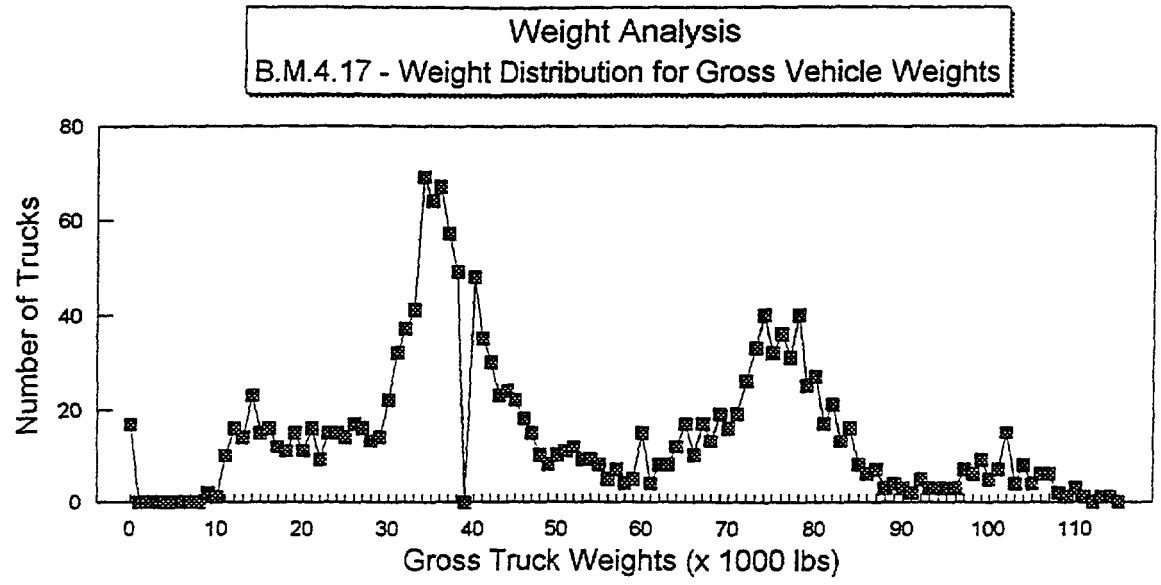

Weight Analysis
B.M.4.12 - Legally Laden Trucks Unnecessarily Stopped for Single Axle Loading
Legal Trucks Unnecessarily Stopped
25%
20%
15%
10%
5%
0%
14
16
18
20
22
24
Screening Weight Limit (x 1,000 lbs)
Bow Hill, WA. April 13, 1993
Single Axle Weight. Standard Deviation: 12.6%

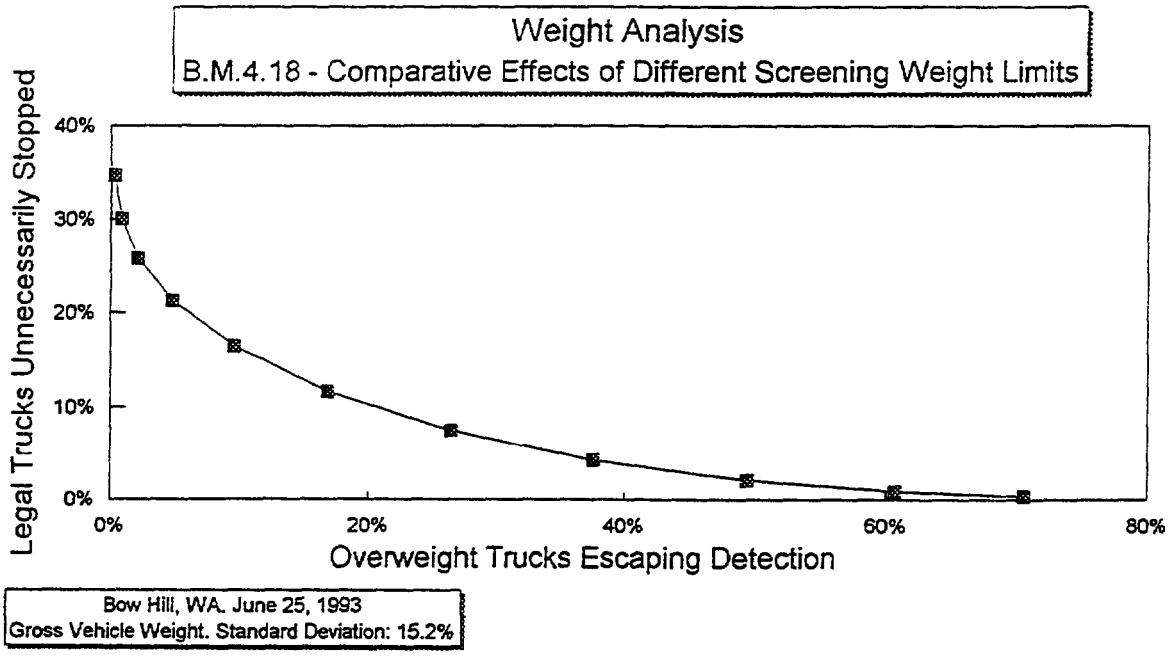

Weight Analysis
B.M.4.13 - Weight Distribution for Tandem Axles
Number of Tandem Axles
200
150
100
50
0
0
10
20
30
Tandem Axle Weights (x 1000 lbs)
Bow Hill, WA. April 13, 1993
Sample Size - 2878

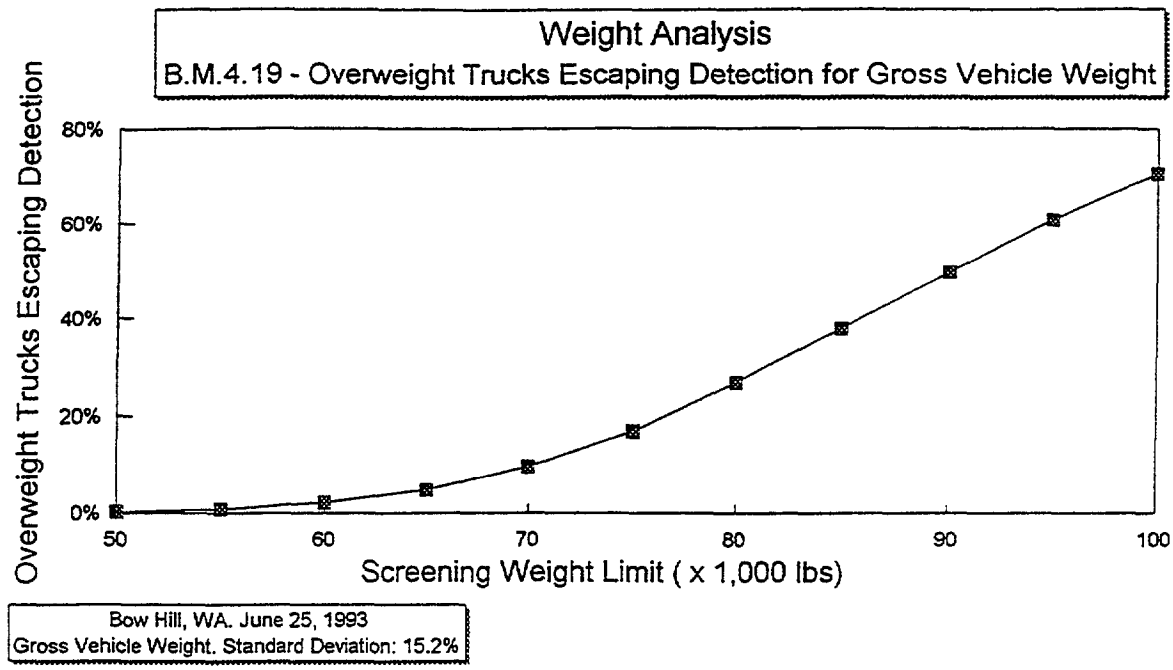

Weight Analysis
B.M.4.14 - Comparative Effects of Different Screening Weight Limits
Legal Trucks Unnecessarily Stopped
30%
25%
20%
15%
10%
5%
0%
0%
20%
40%
60%
80%
Overweight Trucks Escaping Detection
Bow Hill, WA. April 13, 1993
Tandem Axle Weight. Standard Deviation: 12.6%

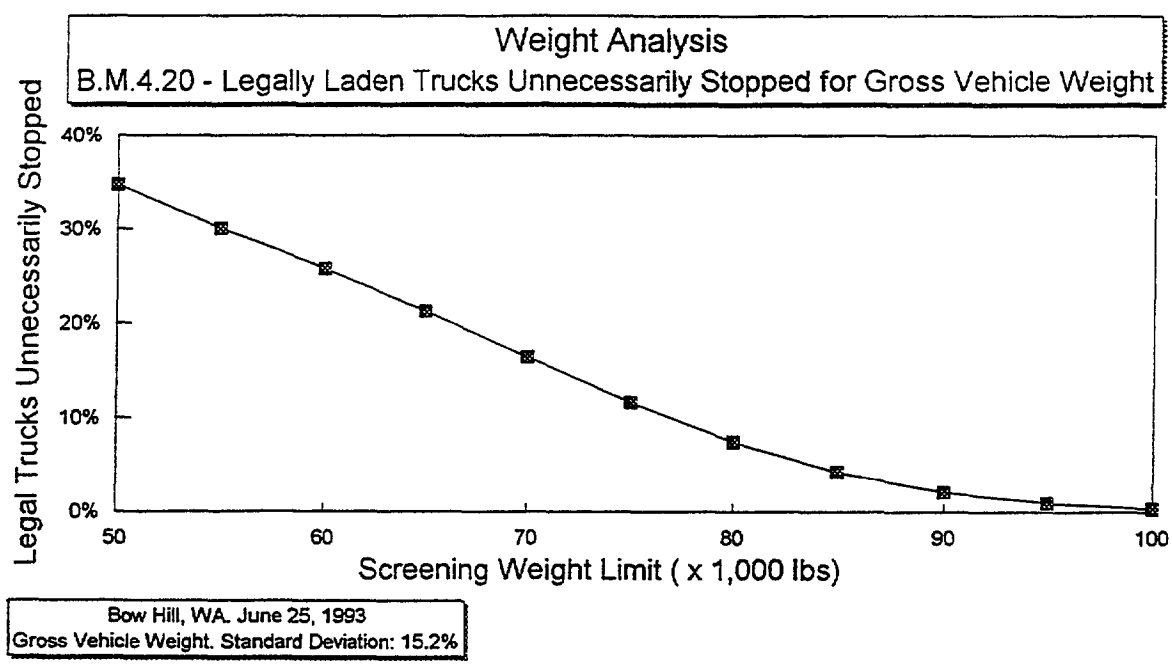

Weight Analysis
B.M.4.15 - Overweight Trucks Escaping Detection for Tandem Axle Loading
Overweight Trucks Escaping Detection
80%
60%
40%
20%
0%
28
30
32
34
36
38
Screening Weight Limit (x 1,000 lbs)
Bow Hill, WA. April 13, 1993
Tandem Axle Weight. Standard Deviation: 12.6%

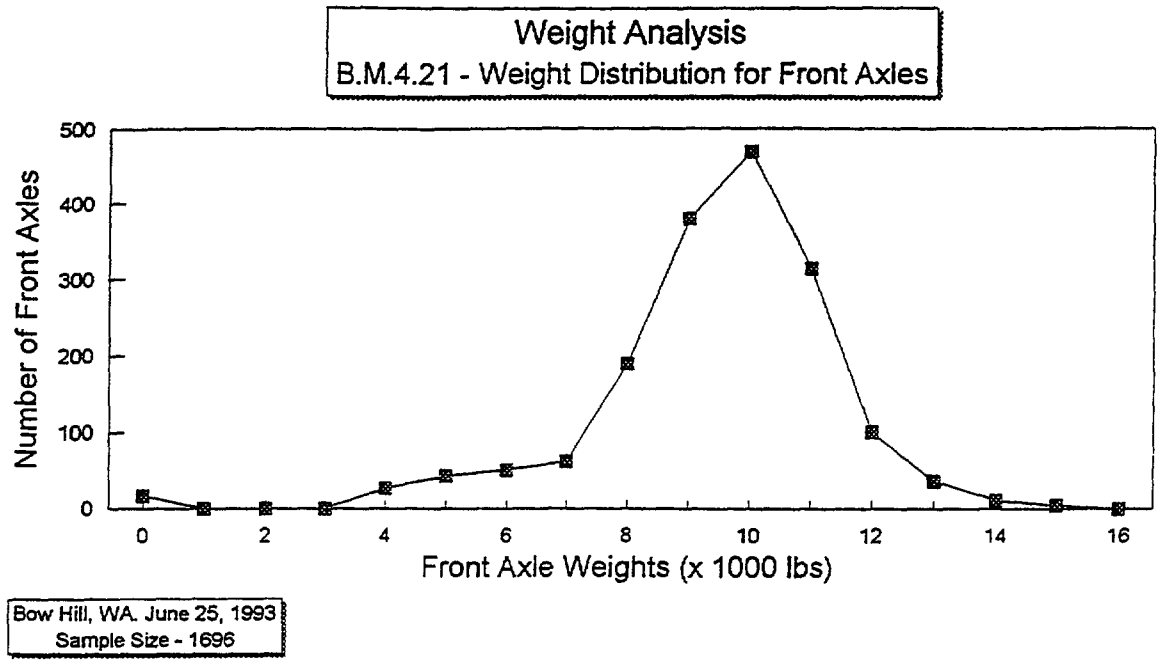

Weight Analysis
B.M.4.16 - Legally Laden Trucks Unnecessarily Stopped for Tandem Axle Loading
Legal Trucks Unnecessarily Stopped
30%
25%
20%
15%
10%
5%
0%
28
30
32
34
36
38
Screening Weight Limit (x 1,000 lbs)
Bow Hill, WA. April 13, 1993
Tandem Axle Weight. Standard Deviation: 12.6%

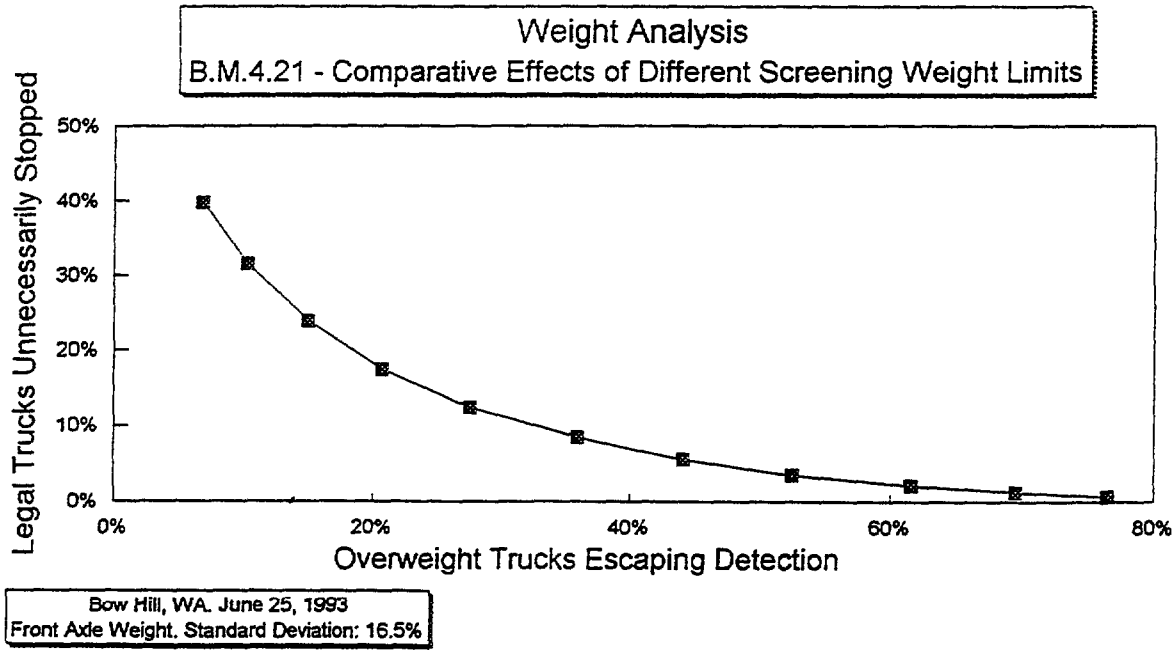

Weight Analysis
B.M.4.17 - Weight Distribution for Gross Vehicle Weights
Number of Trucks
0
20
40
60
80
0
10
20
30
40
50
60
70
80
90
100
110
Gross Truck Weights (x 1000 lbs)
Bow Hill, WA. June 25, 1993
Sample Size - 1696

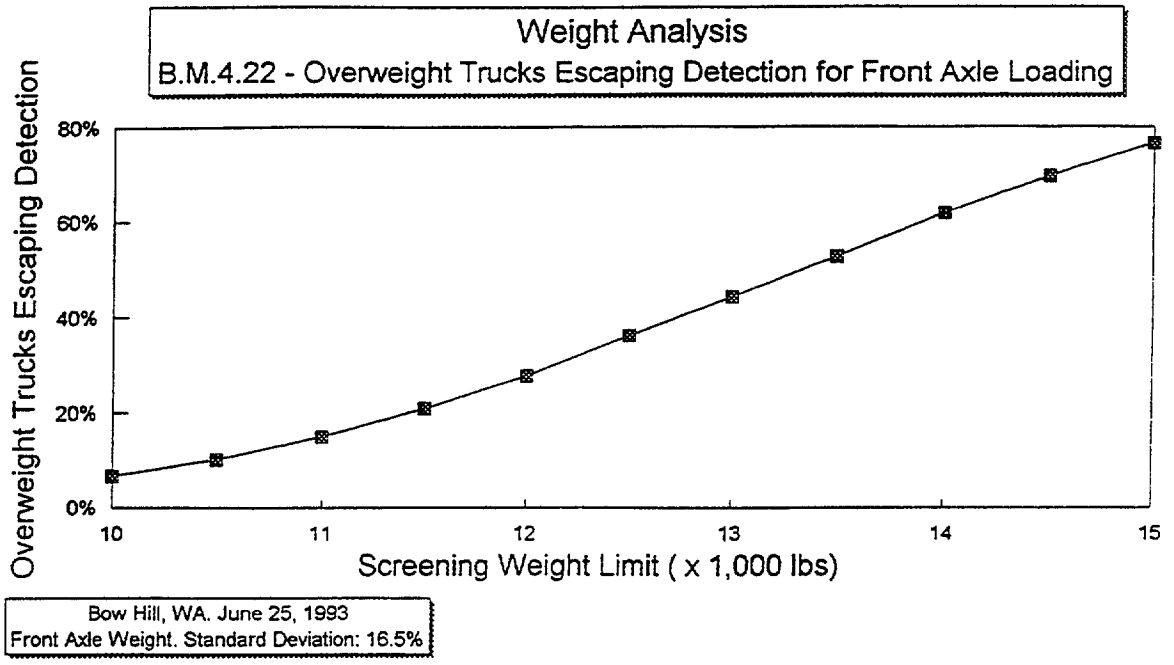

Weight Analysis
B.M.4.18 - Comparative Effects of Different Screening Weight Limits
Legal Trucks Unnecessarily Stopped
0%
10%
20%
30%
40%
0%
20%
40%
60%
80%
Overweight Trucks Escaping Detection
Bow Hill, WA. June 25, 1993
Gross Vehicle Weight. Standard Deviation: 15.2%

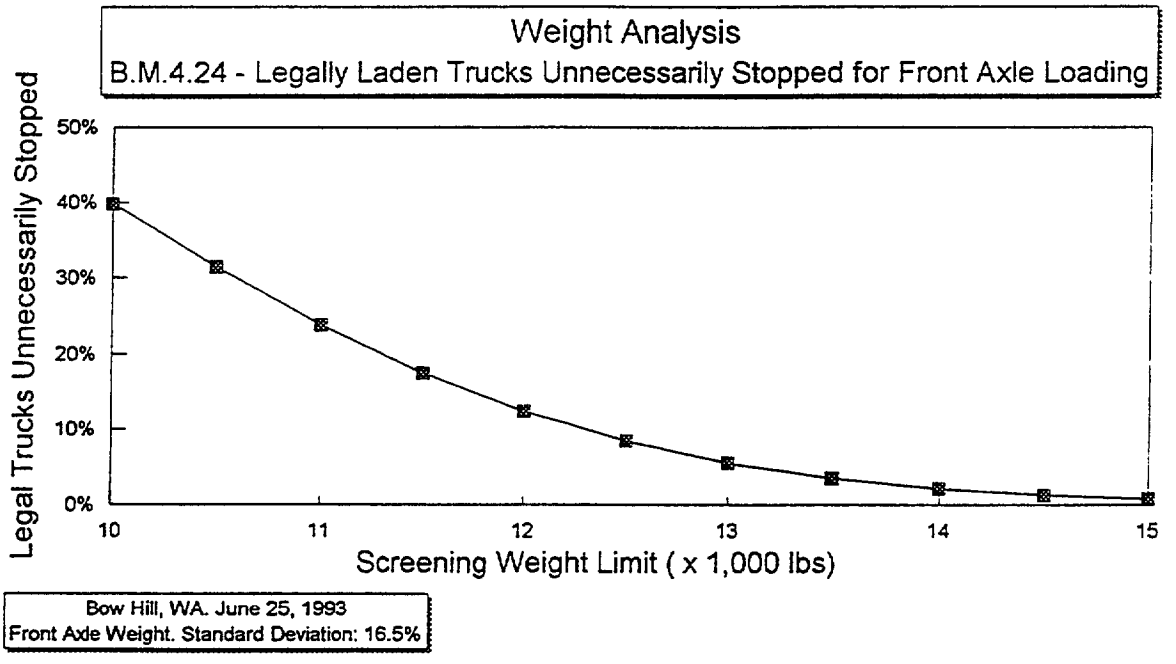

Weight Analysis
B.M.4.19 - Overweight Trucks Escaping Detection for Gross Vehicle Weight
Overweight Trucks Escaping Detection
80%
60%
40%
20%
0%
50
60
70
80
90
100
Screening Weight Limit (x 1,000 lbs)
Bow Hill, WA. June 25, 1993
Gross Vehicle Weight. Standard Deviation: 15.2%

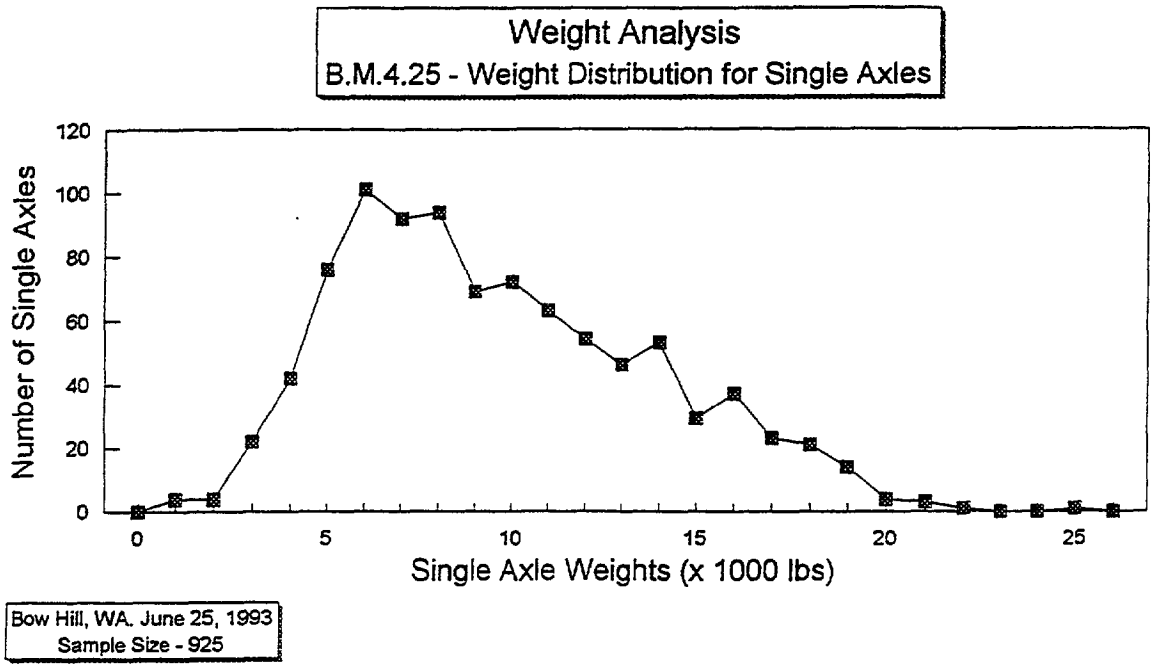

Weight Analysis
B.M.4.20 - Legally Laden Trucks Unnecessarily Stopped for Gross Vehicle Weight
Legal Trucks Unnecessarily Stopped
40%
30%
20%
10%
0%
50
60
70
80
90
100
Screening Weight Limit (x 1,000 lbs)
Bow Hill, WA. June 25, 1993
Gross Vehicle Weight. Standard Deviation: 15.2%

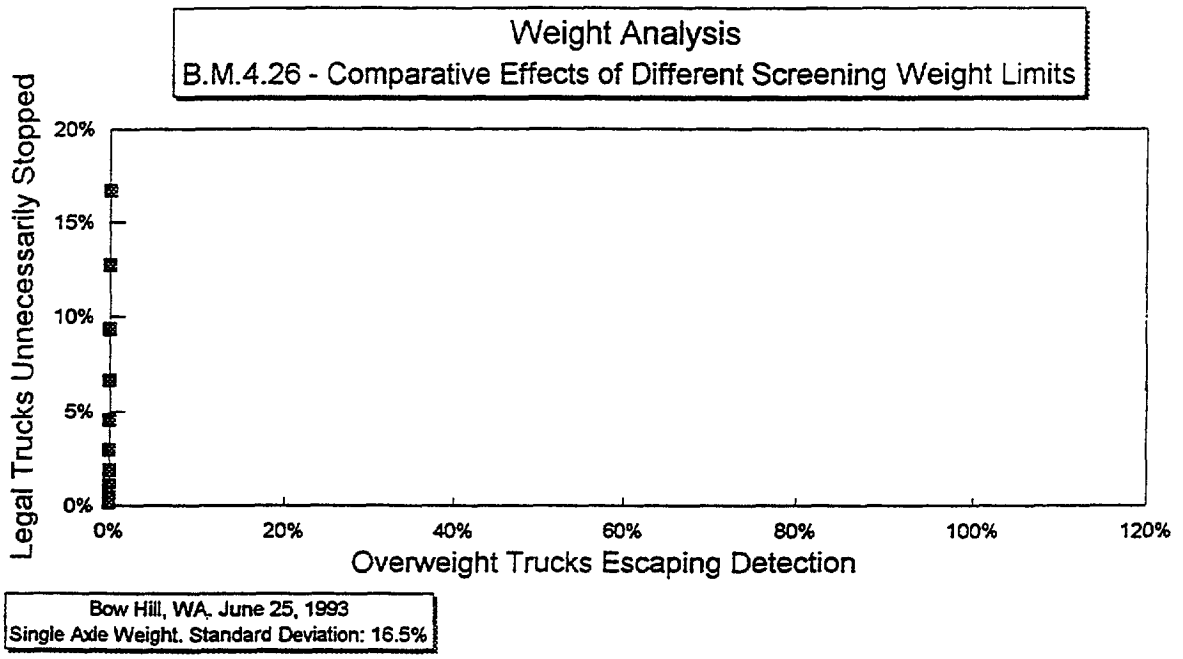

Weight Analysis
B.M.4.21 - Weight Distribution for Front Axles
Number of Front Axles
500
400
300
200
100
0
0
2
4
6
8
10
12
14
16
Front Axle Weights (x 1000 lbs)
Bow Hill, WA. June 25, 1993
Sample Size - 1696

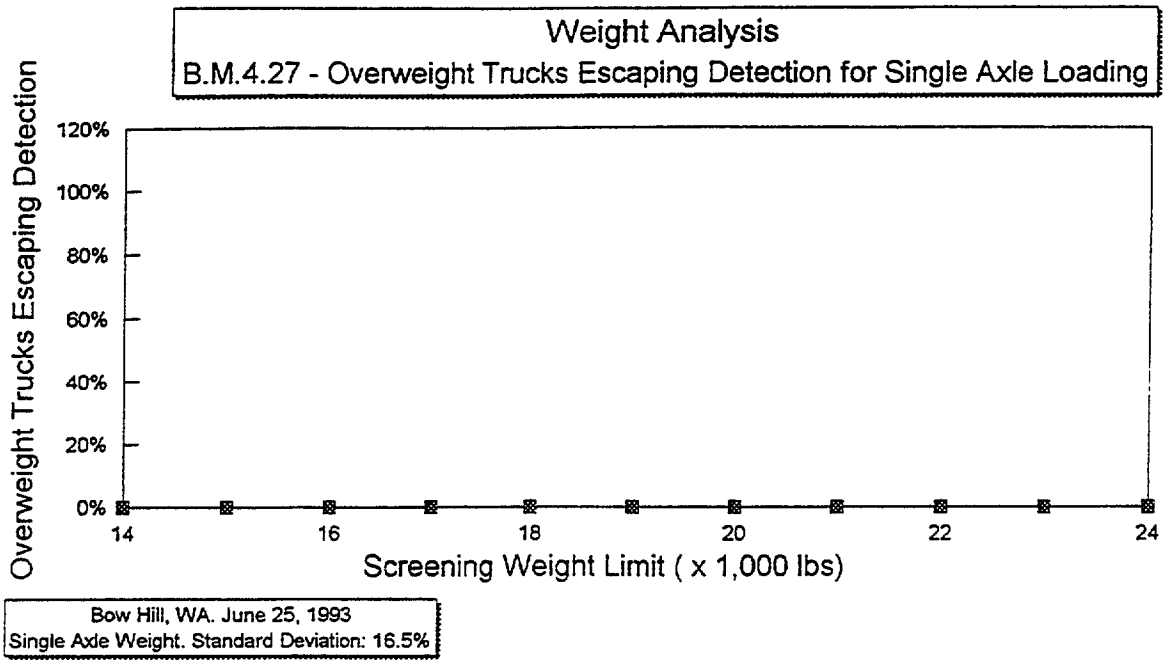

Weight Analysis
B.M.4.21 - Comparative Effects of Different Screening Weight Limits
Legal Trucks Unnecessarily Stopped
50%
40%
30%
20%
10%
0%
0%
20%
40%
60%
80%
Overweight Trucks Escaping Detection
Bow Hill, WA. June 25, 1993
Front Axle Weight. Standard Deviation: 16.5%

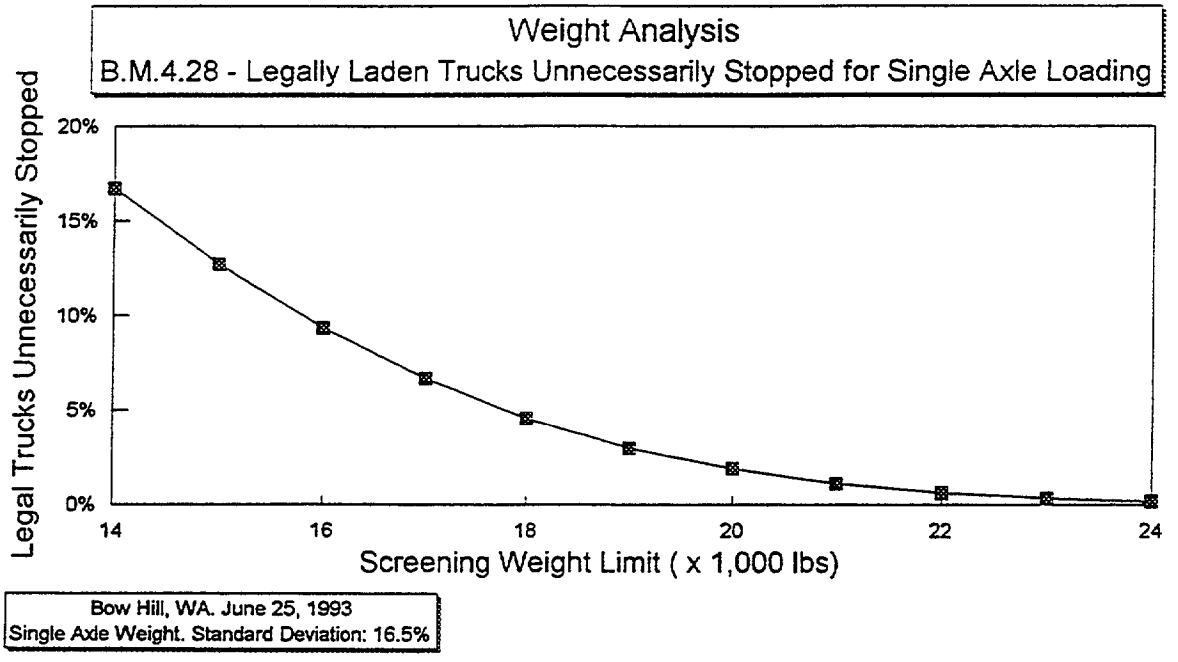

Weight Analysis
B.M.4.22 - Overweight Trucks Escaping Detection for Front Axle Loading
Overweight Trucks Escaping Detection
80%
60%
40%
20%
0%
10
11
12
13
14
15
Screening Weight Limit (x 1,000 lbs)
Bow Hill, WA. June 25, 1993
Front Axle Weight. Standard Deviation: 16.5%

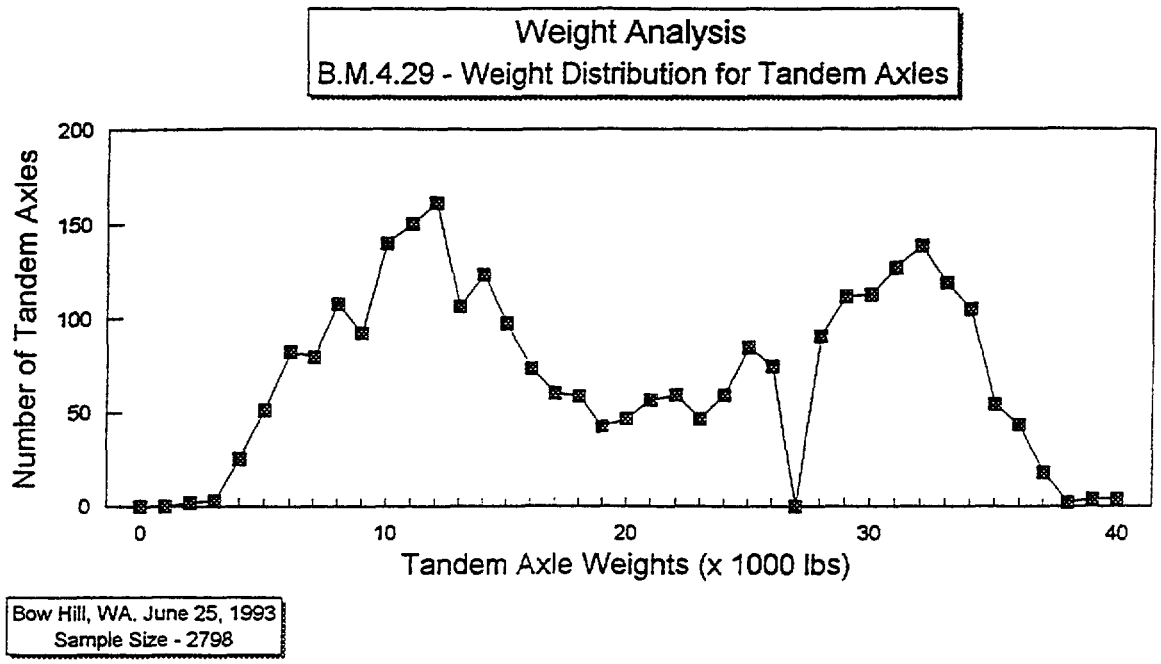

Weight Analysis
B.M.4.24 - Legally Laden Trucks Unnecessarily Stopped for Front Axle Loading
Legal Trucks Unnecessarily Stopped
50%
40%
30%
20%
10%
0%
10
11
12
13
14
15
Screening Weight Limit (x 1,000 lbs)
Bow Hill, WA. June 25, 1993
Front Axle Weight. Standard Deviation: 16.5%

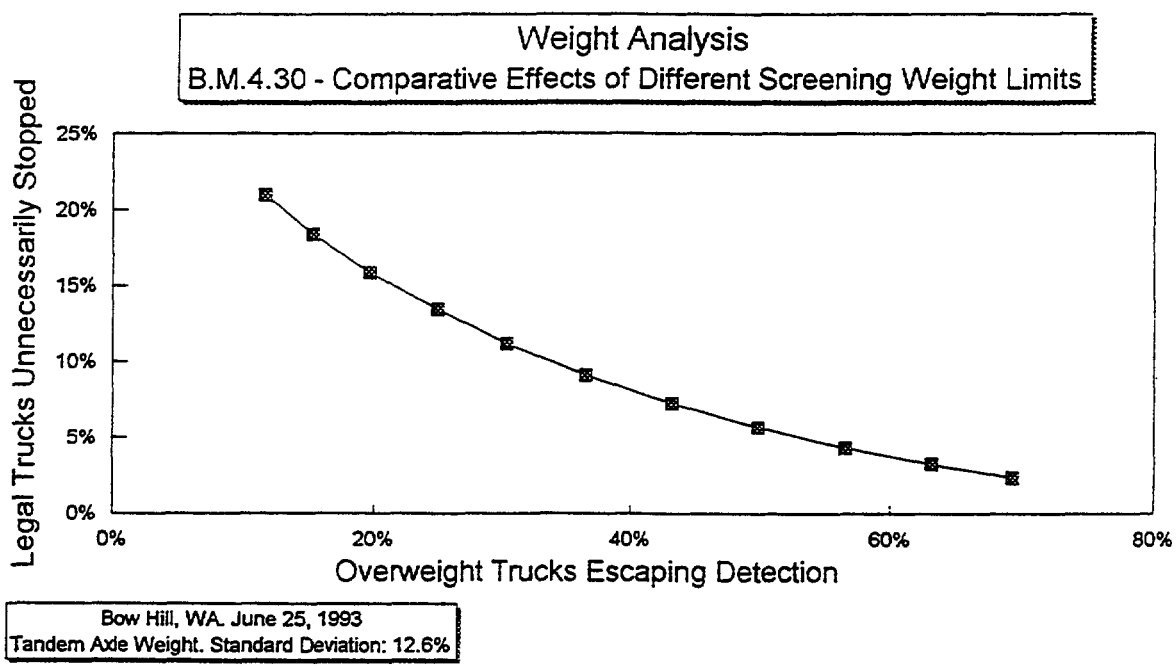

Weight Analysis
B.M.4.25 - Weight Distribution for Single Axles
Number of Single Axles
120
100
80
60
40
20
0
0
5
10
15
20
25
Single Axle Weights (x 1000 lbs)
Bow Hill, WA. June 25, 1993
Sample Size - 925

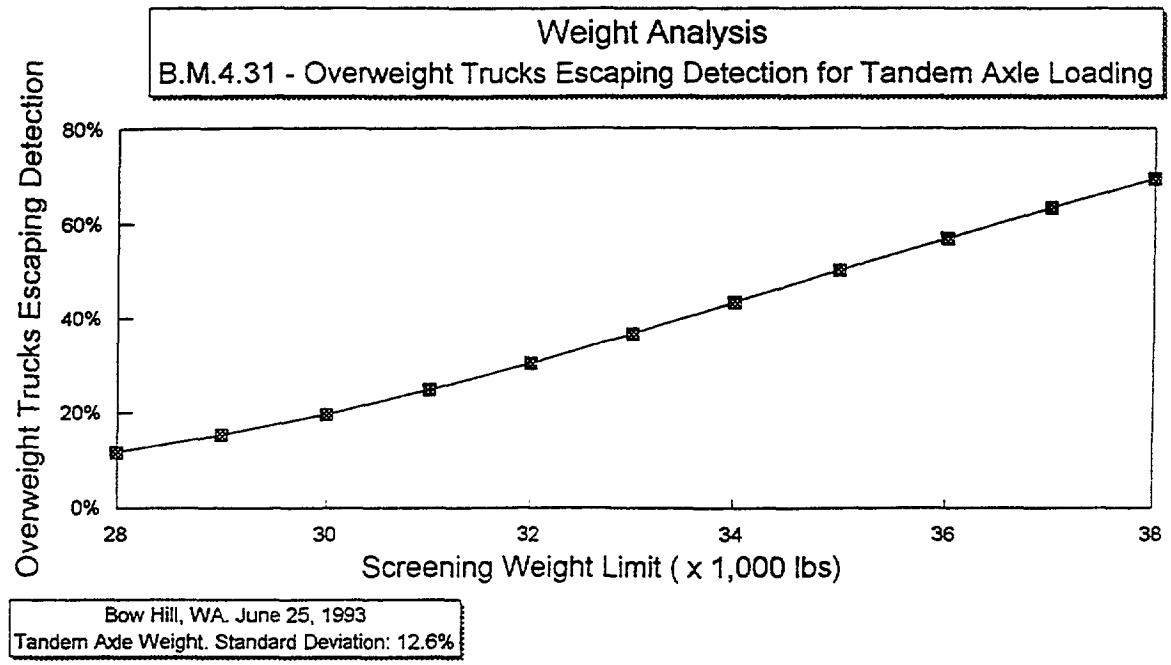

Weight Analysis
B.M.4.26 - Comparative Effects of Different Screening Weight Limits
Legal Trucks Unnecessarily Stopped
20%
15%
10%
5%
0%
0%
20%
40%
60%
80%
100%
120%
Overweight Trucks Escaping Detection
Bow Hill, WA. June 25, 1993
Single Axle Weight. Standard Deviation: 16.5%

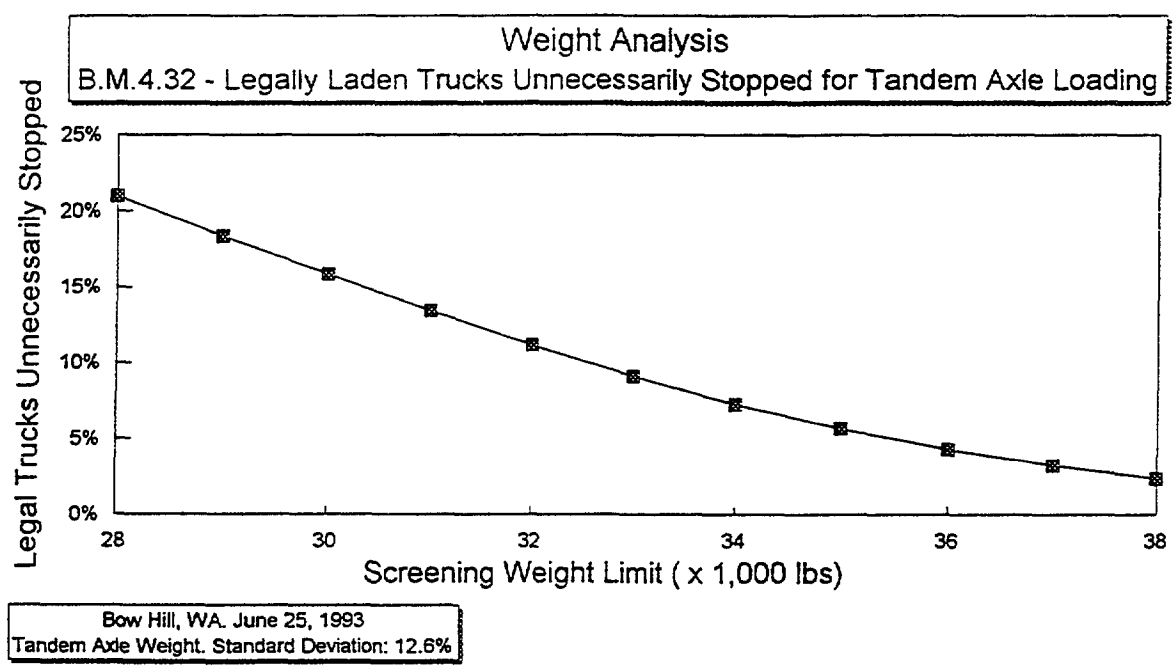

Weight Analysis
B.M.4.27 - Overweight Trucks Escaping Detection for Single Axle Loading
Overweight Trucks Escaping Detection
120%
100%
80%
60%
40%
20%
0%
14
16
18
20
22
24
Screening Weight Limit (x 1,000 lbs)
Bow Hill, WA. June 25, 1993
Single Axle Weight. Standard Deviation: 16.5%


Weight Analysis
B.M.4.28 - Legally Laden Trucks Unnecessarily Stopped for Single Axle Loading
Legal Trucks Unnecessarily Stopped
20%
15%
10%
5%
0%
14
16
18
20
22
24
Screening Weight Limit (x 1,000 lbs)
Bow Hill, WA. June 25, 1993
Single Axle Weight. Standard Deviation: 16.5%


Weight Analysis
B.M.4.29 - Weight Distribution for Tandem Axles
Number of Tandem Axles
200
150
100
50
0
0
10
20
30
40
Tandem Axle Weights (x 1000 lbs)
Bow Hill, WA. June 25, 1993
Sample Size - 2798


Weight Analysis
B.M.4.30 - Comparative Effects of Different Screening Weight Limits
Legal Trucks Unnecessarily Stopped
25%
20%
15%
10%
5%
0%
0%
20%
40%
60%
80%
Overweight Trucks Escaping Detection
Bow Hill, WA. June 25, 1993
Tandem Axle Weight. Standard Deviation: 12.6%


Weight Analysis
B.M.4.31 - Overweight Trucks Escaping Detection for Tandem Axle Loading
Overweight Trucks Escaping Detection
80%
60%
40%
20%
0%
28
30
32
34
36
38
Screening Weight Limit (x 1,000 lbs)
Bow Hill, WA. June 25, 1993
Tandem Axle Weight. Standard Deviation: 12.6%


Weight Analysis
B.M.4.32 - Legally Laden Trucks Unnecessarily Stopped for Tandem Axle Loading
Legal Trucks Unnecessarily Stopped
25%
20%
15%
10%
5%
0%
28
30
32
34
36
38
Screening Weight Limit (x 1,000 lbs)
Bow Hill, WA. June 25, 1993
Tandem Axle Weight. Standard Deviation: 12.6%

OVERWEIGHT VEHICLES

This section provides the results from the analysis of vehicle and axle weights. Each table gives the total number of vehicles in the sample, and the number and proportion of vehicles overweight under one of the following criteria:

(1) gross vehicle weight,
(2) front axle weight,
(3) other single axle weight,
(4) tandem axle weight, and
(5) the federal 'bridge' formula.

To provide a large sample size for the truck weight and axle weight distributions the WIM records for the day of the evaluation study have been utilized. The WIM data that forms the basis of these overweight calculations has been adjusted in by the mean percentage difference found during the static/dynamic weight comparisions for individual sites. This adjustment is made to achieve an approximate recalibration of the WIM systems. Results for the following sites are presented:

* Jefferson,
* Ashland,
* Bakersfield,
* South Pheonix.
* Kelso,
* Woodburn, and
* Bow Hill.

* It should be noted that the figures quoted for the violations under the bridge formula are those instances where the bridge formula alone has been violated. This does not include those

vehicles that also have overweight violations under the gross vehicle weight, front axle weight, other single axles or tandem axles.

Some vehicles violate more than one of the screening criteria, hence the total number and proportion of overweight vehicles is generally less than the sum of the individual screening criteria.

JEFFERSON, OR - APRIL 7, 1993

TABLE B.A.5.1 - PROPORTION OF OVERWEIGHT VEHICLES

	COUNT	PERCENTAGE (%)
TOTAL NUMBER OF VEHICLES	3199	
GROSS WEIGHT > 80,000 LBS	878	27.4
FRONT AXLE WEIGHT > 13,200 LBS	156	4.9
SINGLE AXLE WEIGHT > 20,000 LBS	216	6.8
TANDEM AXLE WEIGHT > 34,000 LBS	589	18.4
TRUCKS VIOLATING THE BRIDGE FORMULA*	0	0.0
TOTAL OVERWEIGHT VEHICLES	1037	32.4

The results have been generated from WIM records for lane 1 of the Jefferson site on April 7, 1993.

ASHLAND, OR - APRIL 5,1993

TABLE B.B.5.1 - PROPORTION OF OVERWEIGHT VEHICLES

	COUNT	PERCENTAGE (%)
TOTAL NUMBER OF VEHICLES	1268	
GROSS WEIGHT > 80,000 LBS	124	9 . 8
FRONT AXLE WEIGHT > 13,200 LBS	10	0.8
SINGLE AXLE WEIGHT > 20,000 LBS	17	1.4
TANDEM AXLE WEIGHT > 34,000 LBS	191	15.1
TRUCKS VIOLATING THE BRIDGE FORMULA*	0	0.0
TOTAL OVERWEIGHT VEHICLES	221	17.4

These results were generated from WIM records for the Ashland site on April 5, 1993.

BAKERSFIELD, CA - APRIL, 16, 1993

TABLE B.C.5.1 - PROPORTION OF OVERWEIGHT VEHICLES

	COUNT	PERCENTAGE (%)
TOTAL NUMBER OF VEHICLES	2266	
GROSS WEIGHT > 80,000 LBS	138	6.1
FRONT AXLE WEIGHT > 13,200 LBS	70	3.1
SINGLE AXLE WEIGHT > 20,000 LBS	108	4.8
TANDEM AXLE WEIGHT > 34,000 LBS	563	24.8
TRUCKS VIOLATING THE BRIDGE FORMULA*	0	0.0
TOTAL OVERWEIGHT VEHICLES	596	26.3

These results were generated from WIM records for the Bakersfield, CA site on April 16. 1993.

SOUTH PHEONIX, AZ - MARCH 25,1993

TABLE B.D.4.1 - PROPORTION OF OVERWEIGHT VEHICLES

	COUNT	PERCENTAGE (%)
TOTAL NUMBER OF VEHICLES	4979	
GROSS WEIGHT > 80,000 LBS	94	1.9
FRONT AXLE WEIGHT > 12,000 LBS	454	9.1
SINGLE AXLE WEIGHT > 20,000 LBS	44	0.9
TANDEM AXLE WEIGHT > 34,000 LBS	312	6.3
TRUCKS VIOLATING THE BRIDGE FORMULA*	0	0.0
TOTAL OVERWEIGHT VEHICLES	628	12.6

These results were generated from WIM records for lanes 2, 3, 4, 5, 6, and 7 of the South Pheonix, AZ site on March 25, 1993. There was a total of 9977 vehicle WIM records, however the WIM system did not record truck weight data on 4998 vehicles.

KELSO, WA -JULY 29,1993

TABLE B.F.5.1 - PROPORTION OF OVERWEIGHT VEHICLES

	COUNT	PERCENTAGE (%)
TOTAL NUMBER OF VEHICLES	3306	
GROSS WEIGHT > 80,000 LBS	617	18.7
FRONT AXLE WEIGHT > 13,200 LBS	so3	15.2
SINGLE AXLE WEIGHT > 20,000 LBS	786	23.8
TANDEM AXLE WEIGHT > 34,000 LBS	201	6.1
TRUCKS VIOLATING THE BRIDGE FORMULA*	0	0.0
TOTAL OVERWEIGHT VEHICLES	1232	37.3

These results were generated from WIM records for the Kelso site on July 29, 1993. There was a total of 3394 vehicle WIM records, however the WIM system did not record truck weight data on 88 vehicles.

WOODBURN, OR - MARCH 8,1993

TABLE B.J.5.1 - PROPORTION OF OVERWEIGHT VEHICLES

	COUNT	PERCENTAGE (%)
TOTAL NUMBER OF VEHICLES	3304	
GROSS WEIGHT > 80,000 LBS	554	16.8
FRONT AXLE WEIGHT > 13,200 LBS	115	3.5
SINGLE AXLE WEIGHT > 20,000 LBS	158	4.8
TANDEM AXLE WEIGHT > 34,000 LBS	329	10.0
TRUCKS VIOLATING THE BRIDGE FORMULA"	0	0.0
TOTAL OVERWEIGHT VEHICLES	784	23.7

These results were generated from WIM records for the Woodbum site on March 8, 1993. There was a total of 3487 vehicle WIM records, however the WIM system did not record truck weight data on 183 vehicles.

WOODBURN, OR - MAY 20,1993

TABLE B.J.5.2 - PROPORTION OF OVERWEIGHT VEHICLES

	COUNT	PERCENTAGE (%)
TOTAL NUMBER OF VEHICLES	3423	
GROSS WEIGHT > 80,000 LBS	543	15.8
FRONT AXLE WEIGHT > 13,200 LBS	92	2.7
SINGLE AXLE WEIGHT > 20,000 LBS	198	5.8
TANDEM AXLE WEIGHT > 34,000 LBS	193	5.6
TRUCKS VIOLATING THE BRIDGE FORMULA*	0	0.0
TOTAL OVERWEIGHT VEHICLES	708	20.7

These results were generated from WIM records for the Woodburn site on May 20, 1993. There was a total of 3750 vehicle WIM records, however the WIM system did not record truck weight data on 322 vehicles.

BOW HILL, WA - APRIL 13, 1993

TABLE B.M.5.1 - PROPORTION OF OVERWEIGHT VEHICLES

	COUNT	PERCENTAGE (%)
TOTAL NUMBER OF VEHICLES	1762	
GROSS WEIGHT > 80,000 LBS	294	16.7
FRONT AXLE WEIGHT > 13,200 LBS	16	0.9
SINGLE AXLE WEIGHT > 20,000 LBS	195	11.1
TANDEM AXLE WEIGHT > 34,000 LBS	46	2.6
TRUCKS VIOLATING THE BRIDGE FORMULA"	0	0.0
TOTAL OVERWEIGHT VEHICLES	362	20.5

These results were generated from WIM records for the Bow Hill site on April 13, 1993. There was a total of 1785 vehicle WIM records, however the WIM system did not record truck weight data on 23 vehicles.

BOW HILL, WA - JUNE 25,1993

TABLE B.M.5.2 - PROPORTION OF OVERWEIGHT VEHICLES

	COUNT	PERCENTAGE (%)
TOTAL NUMBER OF VEHICLES	1679	
GROSS WEIGHT > 80,000 LBS	232	13.8
FRONT AXLE WEIGHT > 13,200 LBS	51	3.1
SINGLE AXLE WEIGHT > 20,000 LBS	30	1.8
TANDEM AXLE WEIGHT > 34,000 LBS	125	7.4
TRUCKS VIOLATING THE BRIDGE FORMULA*	0	0.0
TOTAL OVERWEIGHT VEHICLES	288	17.2

These results were generated from WIM records for the Bow Hill site on April 13, 1993. There was a total of 1696 vehicle WIM records, however the WIM system did not record truck weight data on 17 vehicles.

TRUCK TRANSIT TIMES

This section provides the transit times observed for vehicles to pass through weighstations. Unless otherwise stated, these times relate to the route through the weighstation that passes over the static scale. For each analysis, a screening process has been undertaken to remove abnormally long transit times that result from vehicles that have parked or been restrained within the weighstation.

The division between abnormally long transit times and normal duration transit times has been made at one standard deviation above the mean transit time recorded for vehicles to pass through the site. If the transit times through sites were normally distributed it would be expected that 16 % of vehicles would be considered to have abnormal transit times. The proportion falling above one standard deviation above the mean transit time was found to be less than 16%, indicating that these times are not normally distributed.

Results for the following sites are presented in tabular form:

* Ashland,
* Lordsburg,
* Woodburn,
* San Simon,
* Bow Hill,
* Santa Nella, and
* Banning.

ASHLAND, OR - APRIL 5,1993

TABLE B.B.6.1 - TRANSIT TIMES THROUGH WEIGHSTATION

	Avg. Time (s)	Standard Deviation	Sample Size
All data	228	270	369
Norma1 Transit Time	158	81	337
Abnormal Transit Time	970	414	32

Note: The time dividing abnormal transit times from normal transit times is 498 seconds.

LORDSBURG,NM - MARCH 5,1993

TABLE B.G.6.1 - TRANSIT TIMES THROUGH WEIGHSTATION

	Avg. Time (s)	Standard Deviation	Sample Size
Al1 data	951	843	66
Normal Transit Time	765	345	61
Abnormal Transit Time	3216	1681	5

Note: The time dividing abnormal transit time from normal transit time is 1794 seconds.

WOODBURN, OR - MARCH 9,1993

TABLE B-J-6.1 - TRANSIT TIMES FOR ALL TRUCKS

	Avg. Time (s)	Standard Deviation	Sample Size
All data	82	39	828
Normal Transit Time	74	27	746
Abnormal Transit Time	154	53	82

Note: The time dividing abnormal transit time from normal transit time is 121 seconds.

TABLE B.J.6.2 - TRANSIT TIMES FOR TRUCKS BYPASSED IN SITE

	Avg. Time (s)	Standard Deviation	Sample Size
All data	65	27	488
Normal Transit Time	54	15	396
Abnormal Transit Time	110	16	92

Note: The time dividing abnormal transit time from normal transit time is 92 seconds.

TABLE B.J.6.3 - TRANSIT TIMES FOR TRUCKS STATICALLY WEIGHED

	Avg. Time (s)	Standard Deviation	Sample Size
All data	107	39	340
Normal Transit Time	99	21	312
Abnormal Transit Time	190	78	28

Note: The time dividing abnormal transit time from normal transit time is 146 seconds.

WOODBURN, OR - MAY 21,1993

TABLE B.J.6.4 - TRANSIT TIMES THROUGH WEIGHSTATION

	Avg. Time (s)	Standard Deviation	Sample Size
All data	83	112	524
Normal Transit Time	73	32	518
Abnormal Transit Time	867	669	6

Note: The time dividing abnormal transit time from normal transit time is 195 seconds.

SAN SIMON, NM - FEBRUARY 3, 1993

TABLE B.K.6.1 - TRANSIT TIMES THROUGH WEIGHSTATION

	Avg. Time (s)	Standard Deviation	Sample Size
All data	230	73	313
Normal Transit Time	204	49	257
Abnormal Transit Time	351	35	56

Note: The time dividing abnormal transit time from normal transit time is 303 seconds.

SAN SIMON, NM - MAY 10,1993

TABLE B.K.6.2 - TRANSIT TIMES THROUGH WEIGHSTATION

	Avg. Time (s)	Standard Deviation	Sample Size
All data	283	397	238
Normal Transit Time	168	120	212
Abnormal Transit Time	1221	591	26

Note: The time dividing abnormal transit time from normal transit time is 680 seconds.

BOW HILL, WA - APRIL 14,1993

TABLE B.M.6.1 - TRANSIT TIMES THROUGH WEIGHSTATION

	Avg. Time (s)	Standard Deviation	Sample Size
All data	74	29	116

Note: The time dividing abnormal transit time from normal transit time is 103 seconds. In this case, there were no abnormal transit times.

BOW HILL, WA - JUNE 24,1993

TABLE B.M.6.2 - TRANSIT TIMES THROUGH WEIGHSTATION

	Avg. Time (s)	Standard Deviation	Sample Size
All data	154	135	419
Normal Transit Time	137	53	407
Abnormal Transit Time	731	468	12

Note: The time dividing abnormal transit time from normal transit time is 289 seconds.

SANTA NELLA, CA - MAY 6,1993

TABLE B.0.6.1 - TRANSIT TIMES THROUGH WEIGHSTATION

	Avg. Time (s)	Standard Deviation	Sample Size
All data	170	23	268

Note: The time dividing abnormal transit time from normal transit time is 193 seconds. In this case there were no abnormal transit times identified.

SANTA NELLA, CA - JULY 1,1993

TABLE B.0.6.2 - TRANSIT TIMES THROUGH WEIGHSTATION

	Avg. Time (s)	Standard Deviation	Sample Size
All data	88	76	227
Normal Transit Time	80	18	223
Abnormal Transit Time	535	380	4

Note: The time dividing abnormal transit time from normal transit time is 164 seconds.

BANNING, CA - MAY 13, 193

TABLE B.P.6.1 - TRANSIT TIMES FOR STATICALLY WEIGHED TRUCKS

	Avg. Time (s)	Standard Deviation	Sample Size
All data	460	467	259
Normal Transit Time	390	124	250
Abnormal Transit Time	2241	1472	9

Note: The time dividing abnormal transit time from normal transit time is 927 seconds.

TABLE B.P.6.2 - TRANSIT TIMES FOR TRUCKS BYPASSED IN SITE

	Avg. Time (s)	Standard Deviation	Sample Size
All data	274	329	116
Normal Transit Time	219	77	111
Abnormal Transit Time	1499	993	5

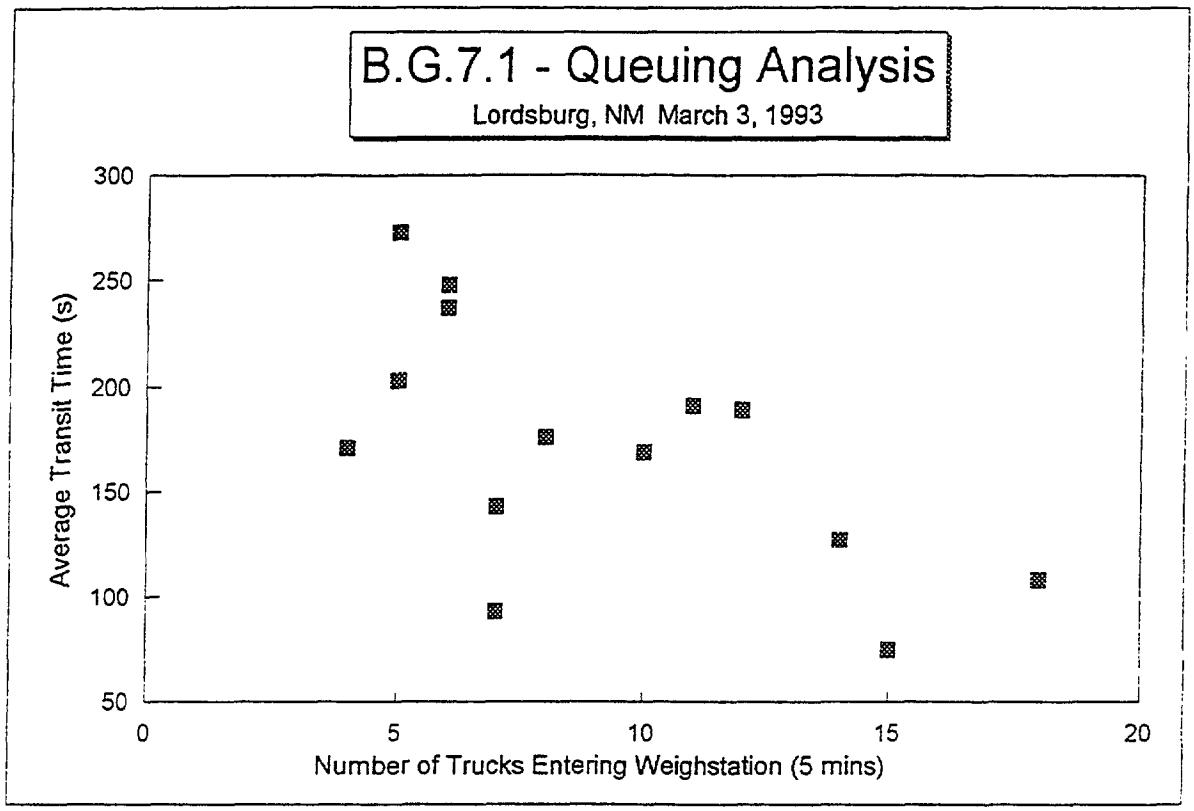
Note: The time dividing abnormal transit time from normal transit time is 603 seconds.

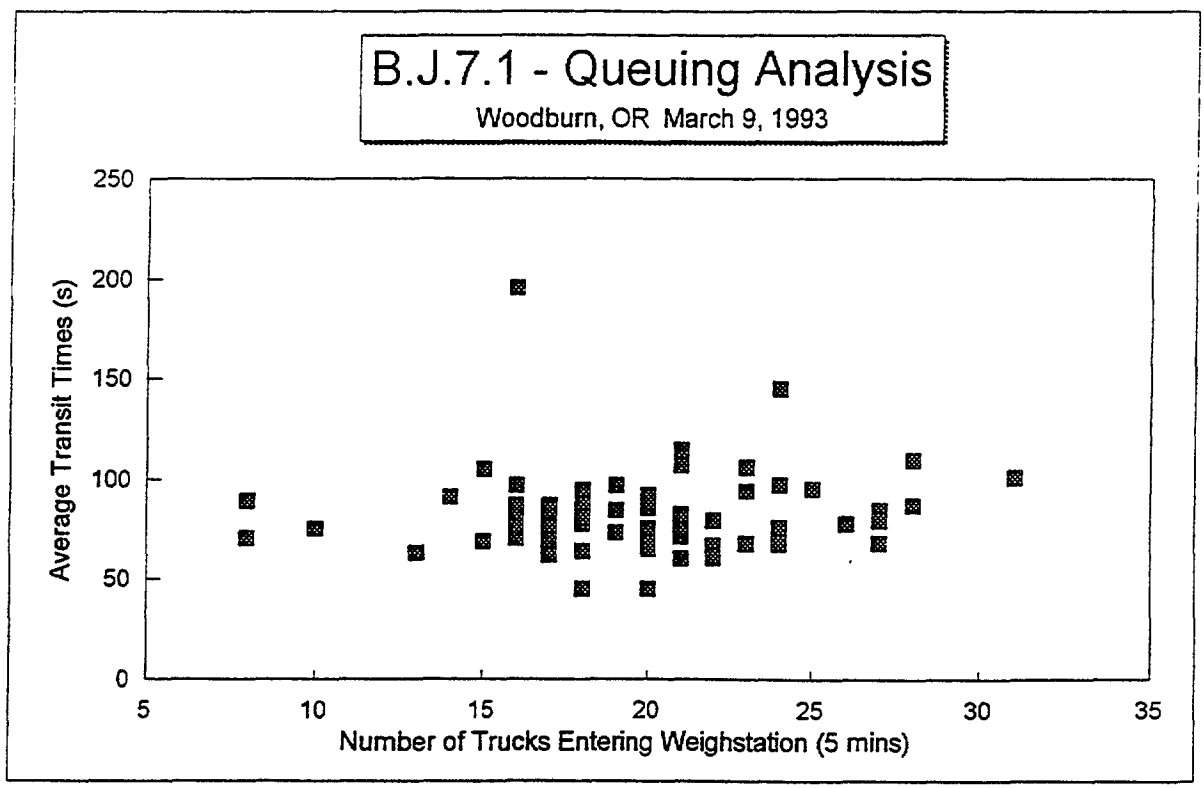
QUEUING ANALYSIS

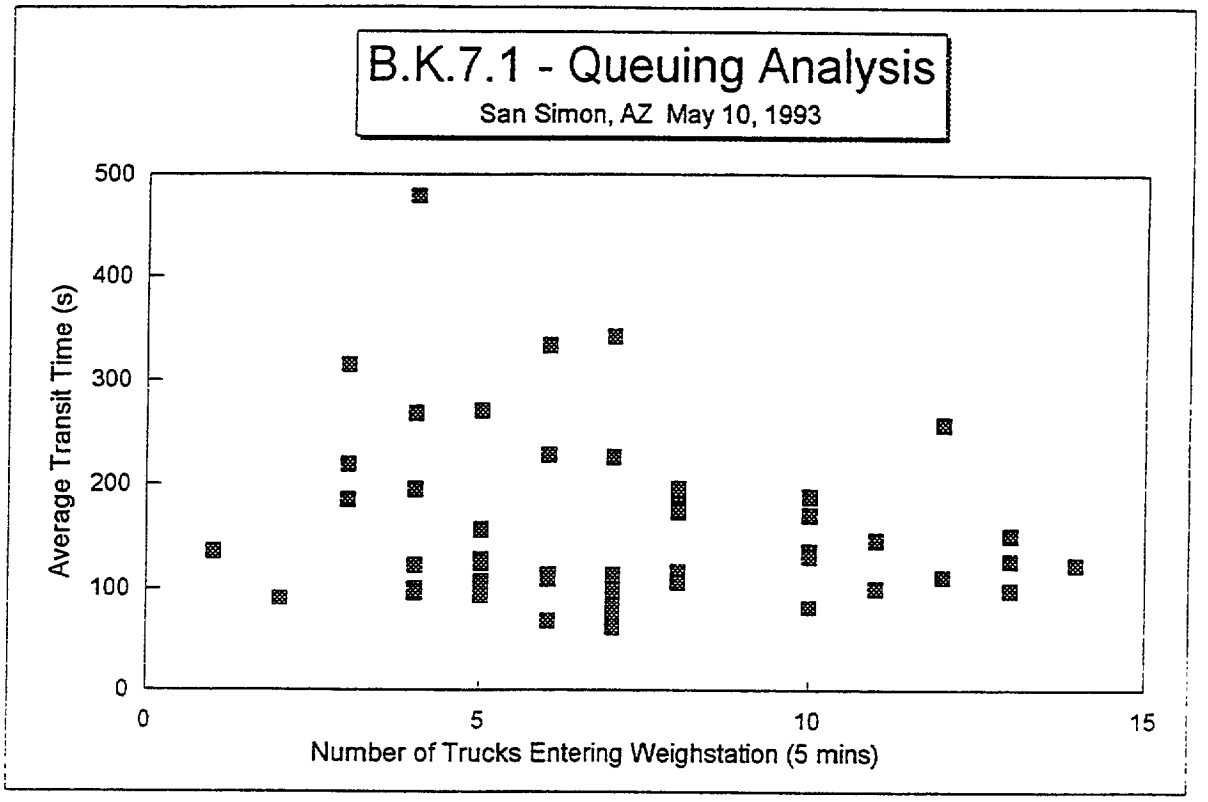
This section contains some of the information used during the queuing analysis at weighstations. The graphs shown display the average transit times for vehicles passing through particular weighstations within selected periods plotted against the number of vehicles entering the weighstation during the same periods. These periods were five minutes in duration. Such graphs have been used to assess the relationship between reduced truck volume entering the weighstations resulting from use of mainline bypassing using the HELP concept and the transit times for the remaining trucks passing through the sites. No clear relationship was established.

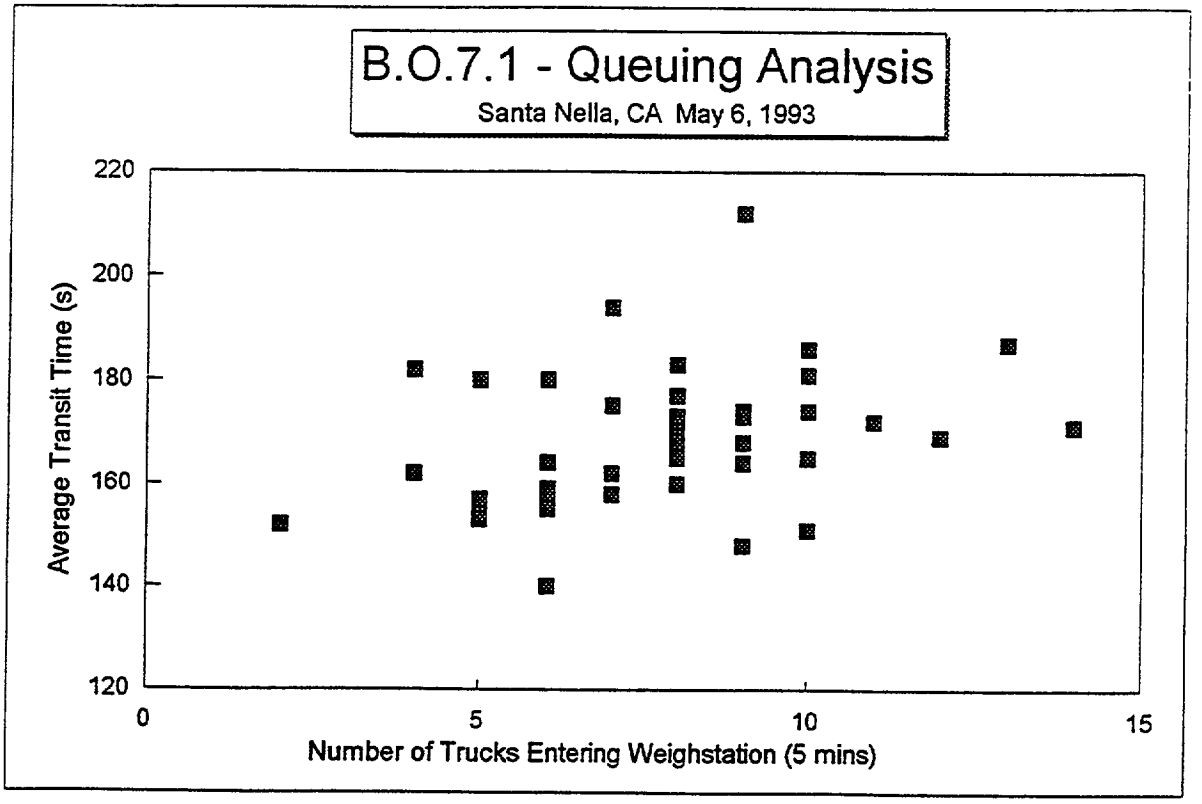
Results for the following sites are displayed:

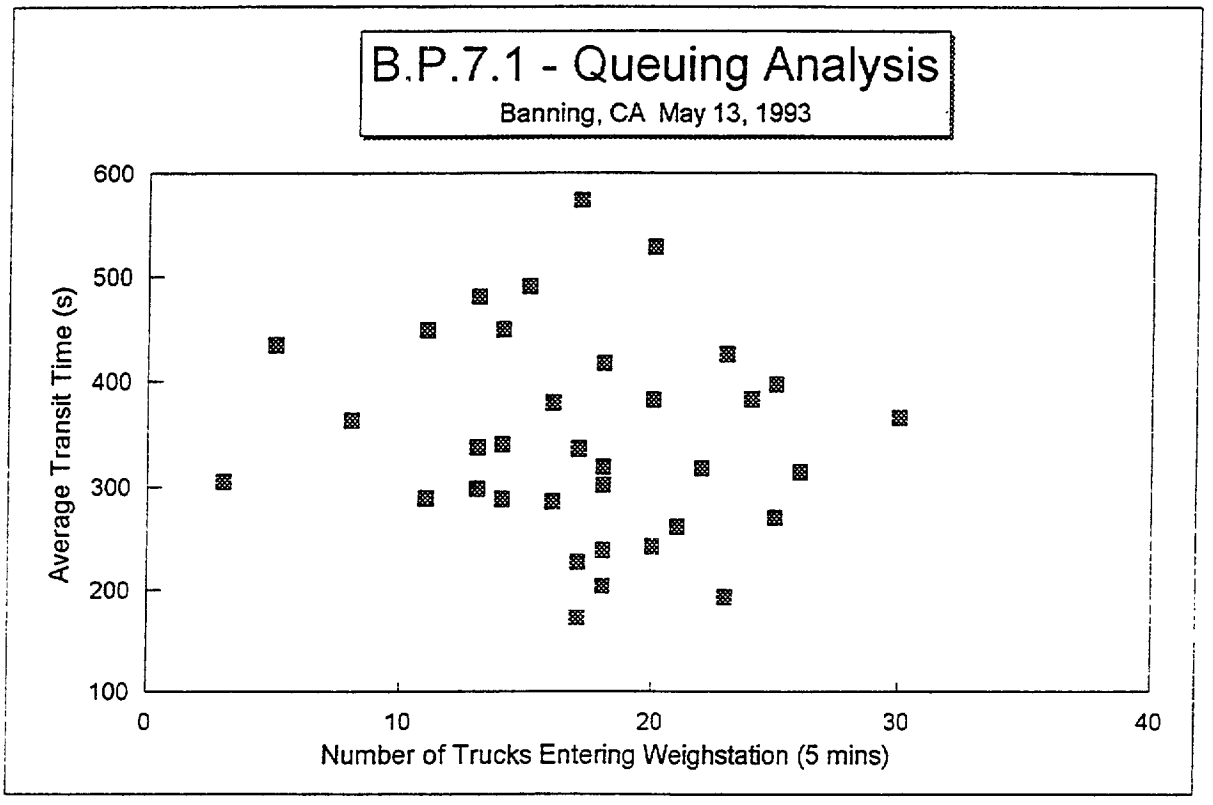
* Lordsburg,
* Woodburn,
* San Simon,
* Santa Nella, and
* Banning.


B.G.7.1 - Queuing Analysis
Lordsburg, NM March 3, 1993
Average Transit Time (s)
300
250
200
150
100
50
0
5
10
15
20
Number of Trucks Entering Weighstation (5 mins)


B.J.7.1 - Queuing Analysis
Woodburn, OR March 9, 1993
Average Transit Times (s)
250
200
150
100
50
0
5
10
15
20
25
30
35
Number of Trucks Entering Weighstation (5 mins)


B.K.7.1 - Queuing Analysis
San Simon, AZ May 10, 1993
Average Transit Time (s)
500
400
300
200
100
0
0
5
10
15
Number of Trucks Entering Weighstation (5 mins)


B.O.7.1 - Queuing Analysis
Santa Nella, CA May 6, 1993
Average Transit Time (s)
220
200
180
160
140
120
0
5
10
15
Number of Trucks Entering Weighstation (5 mins)


B.P.7.1 - Queuing Analysis
Banning, CA May 13, 1993
Average Transit Time (s)
600
500
400
300
200
100
0
10
20
30
40
Number of Trucks Entering Weighstation (5 mins)